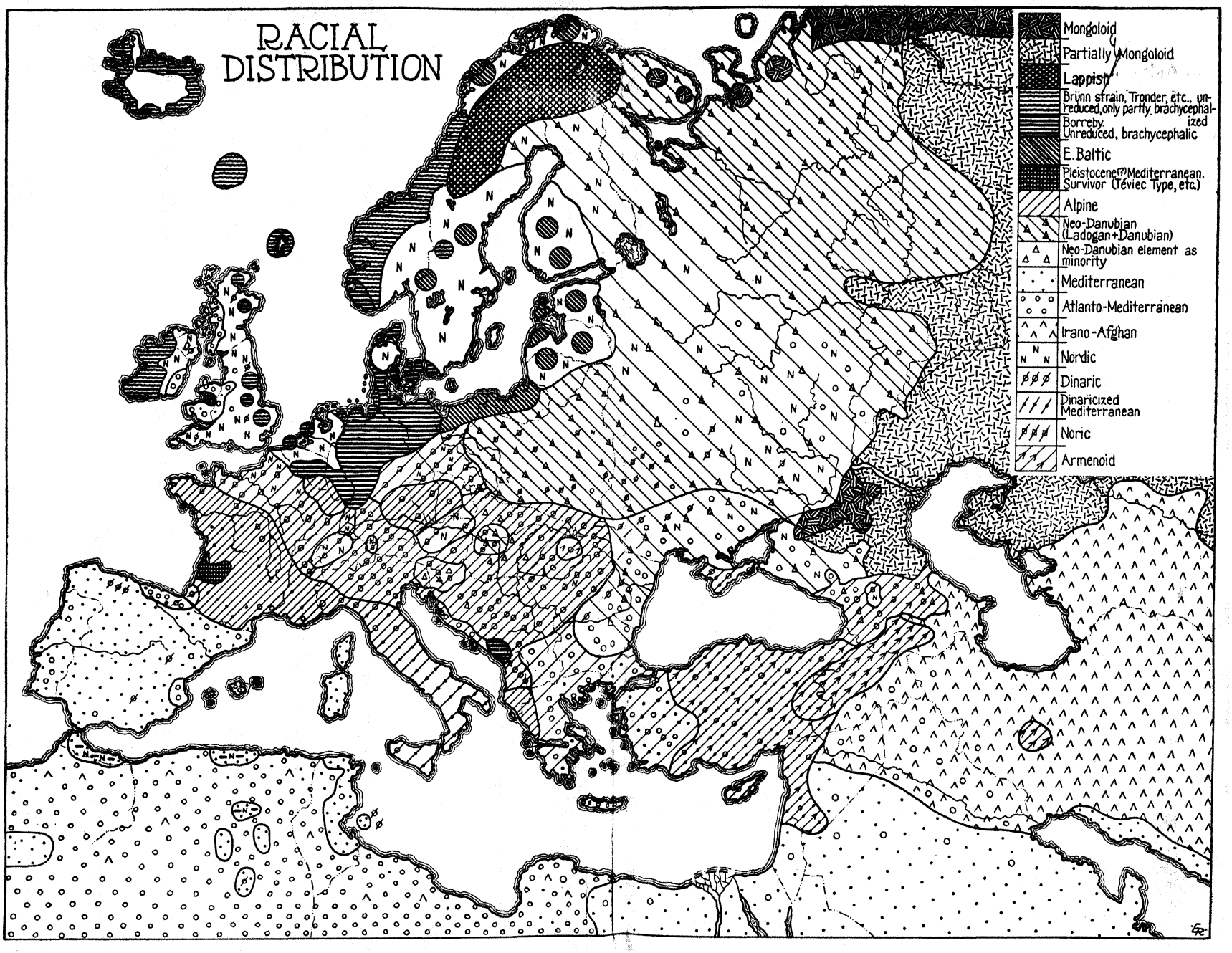

RACIAL DISTRIBUTION
Mongoloid
Partially Mongoloid
Lappish
Brünn strain, Tronder, etc., unreduced, only partly brachycephalized
Borreby. Unreduced, brachycephalic
E. Baltic
Pleistocene(?) Mediterranean. Survivor (Téviec Type, etc.)
Alpine
Neo-Danubian (Ladogan+Danubian)
Neo-Danubian element as minority
Mediterranean
Atlanto-Mediterranean
Irano-Afghan
Nordic
Dinaric
Dinaricized Mediterranean
Noric
Armenoid

The Races of Europe

CARLETON STEVENS COON

Assistant Professor of Anthropology

HARVARD UNIVERSITY

New York

THE MACMILLAN COMPANY

1939

COPYRIGHT, 1939,

BY THE MACMILLAN COMPANY

ALL RIGHTS RESERVED—NO PART OF THIS BOOK MAY BE REPRODUCED IN ANY FORM WITHOUT PERMISSION IN WRITING FROM THE PUBLISHER, EXCEPT BY A REVIEWER WHO WISHES TO QUOTE BRIEF PASSAGES IN CONNECTION WITH A REVIEW WRITTEN FOR INCLUSION IN MAGAZINE OR NEWSPAPER

Published, April, 1939.

SET UP AND ELECTROTYPED BY T. MOREY & SON

PRINTED IN THE UNITED STATES OF AMERICA

To

PROFESSOR WILLIAM Z. RIPLEY,

Author of the earlier and classic

RACES OF EUROPE,

at whose suggestion the present work was begun

and in whose honor it is named.

INTRODUCTION

The present book is offered to the College audience as a text in a specific branch of physical anthropology. In it an attempt is made to trace the racial history of the white division of *Homo sapiens* from its Pleistocene beginnings to the present. Although six chapters are specifically devoted to a study of skeletal material by consecutive cultural periods, the main emphasis is placed upon the racial identification and classification of living white peoples. If there is one consistent theme in this book, it is that physical anthropology cannot be divorced from cultural and historical associations, and that there is no such thing as "pure" biology, at least in reference to human beings.

In writing a book of this character it has been necessary to employ a number of technical terms; the reader will find these defined in the glossary. Statistical tables have been purposely omitted from the text, but since many of the conclusions and identifications made in the chapters of skeletal history are novel, it has seemed advisable to document them by means of tabular material. For this reason the fifty-three columns of basic cranial means have been included as Appendix I.

References to all sources from which material, anthropometric or otherwise, has been drawn are given in footnotes in the sections in which specific data are mentioned. Although over four thousand titles have been consulted in the preparation of this volume, the author makes no pretense to have covered the entire literature of the subject. A number of unimportant references have been purposely omitted, and many others which are important have without doubt been overlooked. Except for materials used with special permission in advance of publication, no reference is made to data appearing later than July, 1938.

Two collateral phases of physical anthropology have, for adequate reasons, been completely avoided: the study of blood groups and the question of racial intelligence or racial psychology. The science of blood groups has, by 1938, developed a prodigious bibliography of its own, and will soon be treated in a special survey by Professor Wm. Boyd of Boston University. So far as specialists in this field have yet determined, there is no genetic linkage between blood group types and anthropometric phenomena. The subject of racial intelligence has, on the other hand, not progressed far enough to merit inclusion in a general work of racial history; it has furthermore provided too ready a field for political exploitation to be treated or interpreted as a side issue with scientific detachment.

Races, in the present volume, are studied without implication of inferiority or superiority.

In the financing of the work, in the collection of data, and in the preparation of the manuscript, many persons have participated. The initial work of collection and preparation was financed, for two years, by generous grants from the Milton Fund and John G. Clark Bequest of Harvard University. Further financing which permitted its completion was provided by my father, Mr. John Lewis Coon, by The Macmillan Company, and by Mr. Lloyd Cabot Briggs. For the original suggestion that I be chosen to write the book, for his support in obtaining the original research funds, and for his continual advice and encouragement, I am deeply indebted to my teacher, Professor Earnest A. Hooton, who initiated me to physical anthropology and to whom I wish to render here an expression of homage and appreciation not only as my personal mentor but also as the spiritual father of American physical anthropology.

Of the many assistants who helped with the tedious labor of translating, abstracting, calculating, plotting, checking, and typing, four deserve especial credit: Mrs. Mary Ruby Gardner, Miss Anna Szugzda, Mr. Eugene C. Worman, and Mr. Jens Yde. Mr. Elmer Rising, who prepared all of the maps, charts, and line drawings, made the task of illustration easy with his experience and coöperation. Mr. Frederick P. Orchard and Miss Marion Lambert assisted in the preparation of the photographic illustrations.

Miss Constance Ashenden, Librarian of the Peabody Museum of Harvard University, under whose direction every article in the scientific periodicals included in the library has been separately catalogued by author, subject, and country, placed at my disposal her great knowledge of the bibliography of anthropology, as well as her time and patience. To her and to Mr. Francis Gould, her assistant, I owe an especial debt of gratitude.

The following persons have permitted me to make use of unpublished anthropometric materials: Dr. Gordon T. Bowles, Mr. C. Wesley Dupertuis, Mr. Robert W. Ehrich, Dr. Henry Field, Mr. James Gaul, Mr. Herbert R. Glodt, Dr. Earnest A. Hooton, Dr. Byron O. Hughes, Dr. Frederick P. Hulse, Dr. W. Marion Krogman, Mr. Homer H. Kidder, Mr. Martin Luther, Dr. Theodore W. McCown, Dr. Geoffrey M. Morant, Dr. Carl C. Seltzer, Dr. William Shanklin, Professor Boris N. Vishnevsky, Mrs. Ruth Sawtelle Wallis, Professor Franz Weidenreich. Each of these persons will be further accredited in reference to the specific material used. It is hoped that a cursory mention of their data in this volume will stimulate interest in their detailed monographs which will follow. Needless to say, none of them is to be held responsible for any erroneous or un-

warranted interpretations which I may have placed on their materials. I wish also to thank in this place those persons and institutions which have permitted me to reproduce photographs and paintings. Individual credit will be given in each instance. The majority of the photographs used in this book, however, were taken by the author, with the generous assistance of many people. These include especially Miss Marion Blackwell, director of the International Institute in Boston, and her assistant Miss Olga St. Ivanyi; Mr. Arthur Megerdichian; Mr. Phillip Way and Mr. Merico Petrolati, of the Ludlow Manufacturing Company, Ludlow, Mass.; Mr. Bror Tamm, Mr. H. W. Johnson, and the owners of the shipbuilding firm of George Lawley and Son; Mr. Ian Drysdale of the A. C. Lawrence Leather Company of Peabody, Mass.; Mr. Michel Abourjaily, of Boston; M. Dumas, of the Dumas Bookshop, Boston; Mr. Heinrich Wolff, manager of Gundlachs Hofbrauhaus in Boston; Father Jan Kozitsky; Mr. John Brunswick and the officers of the Czechoslovakian Club of Boston; Mr. James Stragunas; and numerous others, including all whose photographs appear in the plates illustrating racial types.

For specific advice and assistance, I have especial reason to be grateful to the following: Professor Glover Allen, for advice concerning fauna; Dr. Gordon T. Bowles, for the preparation of Map 16, and for information concerning the peoples of Iran, Afghanistan, and India; Professor Kirk Bryan, for information concerning Pleistocene and post-Pleistocene climate; Professor V. Gordon Childe, for reading the manuscript of Chapters II through VII, and for suggesting many important changes; Dr. Vladimir J. Fewkes, for preparing Maps 2 and 3, and for much advice upon the European archaeology of the Neolithic, Bronze, and Iron Ages, and for data and advice on the subject of Slavic history; Dr. H. O'Neill Hencken, for advice concerning the archaeology of the Iron Age, and of the British Isles in particular; to Mr. Gabriel Lasker, for aid in preparing the glossary; Dr. J. R. de la H. Marett, for ideas and stimulation on the subject of human evolution; Professor William M. McGovern, for permitting me to read the manuscript of his "Early Empires of Central Asia," and for advice on the subject of Central Asiatic history; Dr. Hallam L. Movius, for assistance in the preparation of Map 1 and Figure 16, as well as in the writing of Chapters II and III; Dr. Robert W. Pfeiffer, for data on early Jewish history; Professor J. Dyneley Prince, for expert opinion on the question of Sumerian linguistics; Professor George Sarton, for advice on the handling of references; Mr. Vilhjalmur Stefansson and Mr. Charles Harding, for advice and data on the subject of the Norsemen; Mr. Lauriston Ward, Mr. James Gaul, and Mr. D. W. Lockard, for supervision and assistance on the subject of Near Eastern archaeology; Professor Harry Wolfson, for an elucidation of Jewish history and assist-

ance in preparing the sections on the Jews. To this list must be added the names of Professor M. F. Ashley-Montagu, Professor W. M. Krogman, and Dr. H. L. Shapiro, who read the book in galley proof and are responsible for many necessary changes, deletions, and additions.

As the reader will readily perceive, the experts listed above, most of whom are already renowned as illustrious scholars, have had no small part to play in the preparation of this volume. To them singly and collectively I owe a debt which it will be impossible for me to repay, and to them I offer my apologies if I have betrayed their generosity and their competence.

To Their Majesties the Kings of Yemen and Albania, and to His Highness the Sultan of Mukalla, I also wish to express my gratitude for permission and assistance in the collection of data which are here presented for the first time.

Finally, to the officers and staff of The Macmillan Company, I am deeply indebted for their generosity, coöperation, and forbearance.

C. S. C.

SUDBURY, MASSACHUSETTS,
February, 1939.

CONTENTS

CHAPTER I. INTRODUCTION TO THE HISTORICAL STUDY OF THE WHITE RACE

		PAGES
(1)	STATEMENT OF AIMS AND PROPOSALS	1–3
(2)	THEORY AND PRINCIPLES OF THE CONCEPT *Race*	3–12
(3)	MATERIALS AND TECHNIQUES OF OSTEOLOGY	12–15

CHAPTER II. PLEISTOCENE WHITE MEN

(1)	INTRODUCING *Homo Sapiens*	16–18
(2)	PLEISTOCENE CLIMATE	19–20
(3)	*Sapiens* MEN OF THE MIDDLE PLEISTOCENE	20–23
(4)	NON-*Sapiens* PLEISTOCENE FOSSIL MEN	23–25
(5)	THE NEANDERTHALOID HYBRIDS OF PALESTINE	25–28
(6)	UPPER PALAEOLITHIC MAN IN EUROPE, THE EVIDENCE AS A WHOLE	28–33
(7)	CHRONOLOGICAL AND GEOGRAPHICAL DIFFERENTIATION OF THE EUROPEAN AURIGNACIAN GROUP	33–39
(8)	UPPER PALAEOLITHIC HUNTERS OF NORTH AFRICA	39–44
(9)	AURIGNACIAN MAN IN EAST AFRICA	44–46
(10)	THE MAGDALENIANS	46–49
(11)	UPPER PALAEOLITHIC MAN IN CHINA	49–50
(12)	SUMMARY AND CONCLUSIONS	50–51

CHAPTER III. THE MESOLITHIC PERIOD

(1)	THE HISTORICAL SETTING	56–57
(2)	MESOLITHIC MAN IN AFRICA	57–61
(3)	THE NATUFIANS OF PALESTINE	61–62
(4)	THE MIDDEN-DWELLERS OF THE TAGUS	63–64
(5)	MESOLITHIC MAN IN FRANCE	64–66
(6)	THE OFNET HEAD BURIALS	66–68
(7)	MESOLITHIC MAN IN THE CRIMEA	68–69
(8)	PALAEOLITHIC SURVIVALS IN THE NORTHWEST	69–76
(9)	SUMMARY AND CONCLUSIONS	76–77

CHAPTER IV. THE NEOLITHIC INVASIONS

(1)	INTRODUCTION	78–82
(2)	THE NEOLITHIC AND THE MEDITERRANEAN RACE	82–86

PAGES

(3) Iran and Iraq 86–91
(4) Civilized Men in Egypt 91–98
(5) Neolithic North Africa 98–99
(6) The Neolithic in Spain and Portugal 99–100
(7) The Eastern Source Areas: South, Central, and North 101–104
(8) The Danubian Culture Bearers 104–107
(9) The Corded or Battle-Axe People 107–109
(10) The Neolithic in the British Isles 109–113
(11) Western Europe and the Alpine Race 113–120
(12) Neolithic Scandinavia 120–125
(13) Neolithic Inhabitants of the Northern Forests . . 125–126
(14) Conclusions 126–130

CHAPTER V. THE BRONZE AGE

(1) Introduction 131–135
(2) The Bronze Age in Western Asia 135–140
(3) The Minoans 140–142
(4) The Greeks 142–146
(5) Copper and Bronze in the Western Mediterranean . 146–152
(6) Basques, Phoenicians, and Etruscans 152–154
(7) The Copper Age in Europe North of the Mediterranean Lands: Danubian Movements and Bell Beakers 154–157
(8) The Bronze Age in Britain 157–162
(9) The Bronze Age in Central Europe 162–166
(10) The Bronze Age in the North 166–168
(11) The Bronze Age on the Eastern Plains 168–170
(12) The Final Bronze Age and Cremation 170–171
(13) Summary and Conclusions 171–173

CHAPTER VI. THE IRON AGE

(1) Race, Language, and European Peoples 174–182
(2) The Illyrians 182–186
(3) The Kelts 186–193
(4) The Romans 193–195
(5) The Scythians 195–201
(6) The Germanic Peoples 201–216
(7) The Slavs 216–220
(8) Conclusions 220–222

CHAPTER VII. THE IRON AGE, PART II

(Speakers of Uralic and Altaic)

PAGES

(1) The Finno-Ugrians 223–226
(2) The Turks and Mongols 226–236
(3) Speakers of Uralic and Altaic, and Old World Racial Origins 236–240

CHAPTER VIII. INTRODUCTION TO THE STUDY OF THE LIVING

(1) Materials and Techniques 241–245
(2) The Use of Statistics in Physical Anthropology . . 245–251
(3) Distribution of Bodily Characters:
(a) Stature and Bodily Form 251–256
(4) Distribution of Bodily Characters:
(b) Head Form, Head Size, and Other Metrical Characters of the Head and Face . . . 256–268
(5) Distribution of Bodily Characters:
(c) Pigmentation, the Pilous System, and Morphology of the Soft Parts 269–279
(6) Racial Classification within the White Family . . 279–296

CHAPTER IX. THE NORTH

(1) Introduction 297–298
(2) The Lapps 298–306
(3) The Samoyeds 306–307
(4) Scandinavia; Norway 307–323
(5) Iceland 323–326
(6) Sweden 326–332
(7) Denmark 332–337
(8) The Finno-Ugrians, Introduction 337–342
(9) Racial Characters of the Eastern Finns 342–351
(10) The Baltic Finns: Livs and Esths 351–355
(11) The Baltic Finns: Finland 355–359
(12) The Baltic-Speaking Peoples 360–368
(13) Conclusions 368–369

CHAPTER X. THE BRITISH ISLES

(1) Résumé of Skeletal History 370–376
(2) Ireland 376–384
(3) Great Britain, General Survey 384–398
(4) The British Isles, Summary 398–399

CHAPTER XI. THE MEDITERRANEAN WORLD

PAGES

(1) INTRODUCTION 400–401
(2) THE MEDITERRANEAN RACE IN ARABIA 401–411
(3) IRAQ AND THE COASTAL REGIONS OF THE PERSIAN GULF . 411–415
(4) THE IRANO-AFGHAN RACE; IRAN AND AFGHANISTAN . . 415–422
(5) THE TURKS AS MEDITERRANEANS 422–425
(6) THE VEDDOID PERIPHERY, HADHRAMAUT TO BALUCHISTAN 425–431
(7) PALESTINE, JEWISH ORIGINS, AND THE EASTERN JEWS . . 432–444
(8) THE MEDITERRANEAN RACE IN EAST AFRICA 444–458
(9) THE MODERN EGYPTIANS 458–462
(10) NORTH AFRICA, INTRODUCTION 462–468
(11) THE EASTERN ARABO-BERBERS, LIBYA AND THE OASES . 468–471
(12) THE TUAREG 471–474
(13) EASTERN BARBARY, ALGERIA, AND TUNISIA 474–479
(14) WESTERN BARBARY; MOROCCO AND THE CANARY ISLANDS 480–489
(15) THE IBERIAN PENINSULA 489–498
(16) THE WESTERN MEDITERRANEAN ISLANDS 498–501
(17) THE BASQUES 501–504
(18) THE GYPSIES 504–507
(19) CONCLUSIONS 507–509

CHAPTER XII. THE CENTRAL ZONE, A STUDY IN REËMERGENCE

(1) INTRODUCTION 510–511
(2) FRANCE 511–522
(3) BELGIUM 522–529
(4) THE NETHERLANDS AND FRISIA 529–535
(5) GERMANY 535–547
(6) SWITZERLAND AND AUSTRIA 547–554
(7) ITALY 554–559
(8) THE LIVING SLAVS:
(a) CZECHS AND WENDS 559–563
(9) THE LIVING SLAVS:
(b) POLAND AND RUSSIA 563–576
(10) TURKS, TATARS, AND MONGOLS OF EUROPEAN RUSSIA . . 576–584
(11) THE MAGYARS 584–586
(12) THE LIVING SLAVS:
(c) SERBS, CROATS, AND SLOVENES 587–595
(13) ALBANIA AND THE DINARIC RACE 595–604
(14) THE GREEKS 604–609

PAGES

(15) BULGARIA 609–612
(16) RUMANIA AND THE VLACHS 612–617
(17) THE OSMANLI TURKS 617–622
(18) NEAR EASTERN BRACHYCEPHALS; SYRIA, ARMENIA, AND THE CAUCASUS 622–634
(19) TURKESTAN AND THE TAJIKS 634–638
(20) THE BRACHYCEPHALIZED JEWS: ASIA AND CENTRAL EUROPE 638–646
(21) CONCLUSIONS 646–648

CHAPTER XIII. CONCLUSION

(1) COMMENTS AND REFLECTIONS 649–650
(2) THE WHITE RACE AND THE NEW WORLD 650–652

APPENDICES

I. MEANS OF PRINCIPAL CRANIAL SERIES USED IN CHAPTERS II–VII 655–665
II. GLOSSARY 666–683
III. LIST OF SERIALS AND THEIR ABBREVIATIONS 684–691
IV. LIST OF BOOKS 692–700

INDEXES 701–739

LIST OF MAPS

		PAGES
1.	Mesolithic Geography of N. W. Europe	71
2.	Neolithic Movements and Chronology	80–81
3.	Bronze Age Movements and Chronology	132–133
4.	Iron Age Races of Europe, before Huns and Turks	176–177
5.	Stature	252–253
6.	Cephalic Index	258–259
7.	Head Size	262–263
8.	Pigmentation of Hair and Eyes	270–271
9.	Racial Distribution	294–295
10.	The Distribution of Uralic and Altaic Speech on European Soil	338
11.	County Divisions in Finland	355
12.	The Distribution of Iranian Languages	416
13.	Linguistic Map of the East African Hamitic Area	446
14.	Languages of East-central Europe and the Balkans	561
15.	Tribal Divisions in Northern Albania	596
16.	Peoples of the Caucasus	631

Chapter I

INTRODUCTION TO THE HISTORICAL STUDY OF THE WHITE RACE

(1) STATEMENT OF AIMS AND PROPOSALS

The present book is a textbook designed for the use of college students who have had or are taking a preliminary course in anthropology. Enough of it is, however, written in a non-technical way, so that students of allied disciplines may use it for reference. The subject matter to be studied consists of the body of statistical material collected by the world's physical anthropologists which concern the somatic character of peoples belonging to the white race. This material may be divided into (A), skeletons; and (B), metrical data and observations on the living.

By the use of this material we propose to follow the history of the white race from its Pleistocene[1] beginnings to the present, and to provide a classification of sub-races which will be fully in accord with the facts as we now know them. We submit the thesis that man, as a domestic animal, is extremely variable; and that he has subjected himself, in his wanderings, to all of the environments of the earth, and hence is subject to environmental modification in a way unequalled by any other species. We further suggest that man, through his development of human cultures, has modified his bodily form by his own devices.

During the Pleistocene period there were several species of primates which had attained some degree of human culture, by the acquisition of stone implements, of fire, and of speech. In the present post-glacial or interglacial period, in conformity with the general reduction in faunal varieties, man has been reduced to a single species, unique in a single genus. During the Pleistocene one species, at least, had developed in the manner of a foetalized terrestrial ape, and it is that species which carries today the main stem of *Homo sapiens*. Other species, including the fossil men of Java, of Peking, and *Homo neanderthalensis*, had developed at the same time into a heavier, hypermasculine endocrine form, with a luxuriance of jaws, teeth, and bony crests.

We propose to demonstrate that these non-foetalized species did not wholly die out, but that at least one of them was absorbed into the main

[1] The term Pleistocene is used here to signify the time span which, in Europe, began with the advance of the first Quatenary glaciation and which ended with the retreat of Würm II.

human stem, at some time during the Middle, or the initial part of the Late, Pleistocene. From this amalgamation was produced the large, rugged, and relatively un-foetalized group of Upper Palaeolithic men in Europe, North Africa, and northern Asia. This type of man passed over Bering Straits in early post-glacial times, if not earlier, to provide the basic genetic stock from which the American Indian developed, in combination with later arrivals. From a branch of this hyperborean group there evolved, in northern Asia, the ancestral strain of the entire specialized mongoloid family.

We suggest that the ancestors of the whites in their major form developed during pluvial periods of the Pleistocene in parts of what is now the arid zone reaching from the Sahara to northern India; that in post-glacial times many were forced out of these homes by desiccation, and that some of them originated agriculture and animal husbandry in northeastern Africa and southwestern Asia. From these centers agricultural pioneers followed post-glacial zones of climate into Europe, gradually encroaching upon the lands formerly glaciated. In most of the regions which they occupied they greatly outnumbered the descendants of the hunters and fishers whose ancestors had clung on since glacial times, and many of whom had followed the retreating ice toward its last melting nuclei.

The occupation of all arable lands, and those suitable for grazing, was not completed in a century, or in a millennium; the process was a gradual one, and the withdrawal of the earlier inhabitants into environmentally protected fastnesses equally gradual. The entry of food-producers from Asia and Africa did not take a single route or involve a single people; it was a complex sequence of migrations through several ports of entry. The various strains of food-producers mixed with the food-gatherers whom they encountered, and with each other, until, in our own time, not a single group of complete food-gatherers has remained in white man's territory.

The food-producers seem to have been variants on one central racial theme, the basic Mediterranean. This basic Mediterranean stock varied in many respects, especially in stature and in pigmentation, but in its essential qualities, which segregated it from non-whites, it was remarkably uniform. We do not know that the survivors of the food-gatherers whom the Mediterranean food-producers absorbed were white in soft-part morphology, and there is some evidence that some had begun to evolve in a mongoloid, others perhaps in a negroid, direction. Such variations may be seen within the present composite white racial amalgam.

At any rate, the main conclusion of this study will be that *the present races of Europe are derived from a blend of (A), food-producing peoples from Asia and Africa, of basically Mediterranean racial form, with (B), the descendants of*

interglacial and glacial food-gatherers, produced in turn by a blending of basic Homo sapiens, related to the remote ancestor of the Mediterraneans, with some non-sapiens species of general Neanderthaloid form. The actions and interactions of environment, selection, migration, and human culture upon the various entities within this amalgam, have produced the white race in its present complexity.

In view of these circumstances, the exact classification of living whites into sub-races, such as Nordics, Alpines, Dinarics, and so on, need not be made at this point, but can await (A) the historical study of the white race which will follow in Chapters II to VII; and (B) the survey of the living as a whole which will be made in Chapter VIII. In Chapters IX to XII, inclusive, we will make a more detailed regional survey of the living peoples of Europe to supplement the preceding sections.

(2) THEORY AND PRINCIPLES OF THE CONCEPT *RACE*

Before proceeding to a detailed historical survey or to technical matters, it seems advisable to state at greater length than in the preceding section some of the principles which we believe to govern the formation of human races. First of all the question arises, "What is a race?" and the problem of this definition must be squarely faced. In the course of the present study the author has developed a definite point of view on this subject, which may be expressed as follows: The concept *race* is a general one, and any attempt to chain it down to a more specific meaning represents a too rigid attempt at taxonomy. The use, under strict definition, of such convenient words as sub-race, stock, variety, local type, etc., implies a Linnaean classification of categories which is foreign to the facts of human biological differentiation.

One may, in a group of animals such as man, definitely name and classify the major group to which all individuals belong. All living varieties of human beings are mutually fertile, and there is no other animal with which man may be crossed. Although the fertility test is not necessarily a diagnostic, *Homo sapiens* in the living sense comprises, without question, a species, even if in the formation of the living human group more than one related species, now extinct in the pure form, was absorbed.[2]

So much for the larger group. Within this larger group there are many variations of superficially great importance. There are pygmy men whose mean stature is less than 150 cm. There are giant-like men whose mean stature is over 180 cm. At the same time there are black men and white men; men with kinky hair, men with straight hair; men with beards and without; and so on. Their variation is much greater than that found among wolves, or among tigers, or among any one species of mice. Yet it is not as great as the variation found among dogs, who again form a

[2] See Chapter II, section 5.

single species, and who in turn may include a blend of two—wolf and jackal.

Here again, we must repeat, man is a domestic animal, and as such is subject to the laws which govern animals in domestication. Being less dependent in a direct sense upon a given environment than a wild animal, he is much more variable; having become numerous as a result of this partial emancipation, he has spread into many environments, so that what influences these environments have had upon him have been extremely varied. At the same time the laws which govern his mating are different from those which govern the conjunction of wild animals. Furthermore there has been some degree of selection in this mating, but less than the selection which has so profoundly differentiated the dog.

All of the principles mentioned above have produced, as their effect, a prodigious differentiation within the human species, and one which must at times have proceeded with startling rapidity. At the same time there has taken place an almost equally great mixing and blending of peoples, under circumstances that could hardly occur among wild animals. For example, the mixture between whites and negroes has most frequently involved white men and negro women, and only occasionally the reverse. Within the ranks of mixture, there has often been a selection on the basis of differential social values attached to different combinations of characters. As a result of all these factors, one must not suppose that a racial classification of man into a simple and orderly scheme can be easy.

We have already recognized the concept *species* in regard to man. There is one other concept, wholly theoretical for practical reasons, which may be recognized with equal definition. That is the *pure strain*, the result of generations of inbreeding and selection of recessive characters. In man, the pure strain is impossible to create unless our social system radically changes. In rats, guinea pigs, and fruit flies, it has been created. From rats, guinea pigs, and fruit flies, biologists slowly and painstakingly discover the laws which govern inheritance. They almost unanimously favor the Mendelian form, and there can be little doubt that Mendelism also applies to man. But man is a genetically complex animal, and we do not, apparently, measure characters which are Mendelian units. If we were to measure the right things, we would theoretically find that Mendel's Law is always applicable. The principle of inheritance through blending, by which is derived the formula $\frac{A+B}{2}$, depends upon a multiplicity of compensating Mendelian characters. That these are not always multiple, or that they do not always compensate, is shown by certain instances in which blending has not resulted from mixture.

For example, the height of the cranial vault and the heights of the face

and nose often fail to respond in the expected manner. Negro-white hybrids in the United States have long faces and noses,[3] and so do Ethiopians.[4] Pitcairn Islanders have more convex noses than do either English or Tahitians.[5] Other instances have been found in which human inheritance has failed to assume the character of a blend. These serve merely as examples. Mixture alone, however, cannot create and perpetuate a new racial form, although it can produce new combinations. Mixture when combined with selection, to emphasize the new and eliminate the old, can, however, produce a decisive change.[6]

In view of the complexity of the human species, as a result of its cultural peculiarities which have separated it from the rest of the animal world, it is not easy to define the word "race." Since man is the oldest domestic animal, his variation and selection have operated over an immensely longer span of time than those of the other species for whose present forms he is responsible. Any attempt to classify him by a rigid scheme is immensely difficult, and the scheme must be elastic if it is to work at all. Hence the term "race" must also be elastic. We may recognize, if we like, certain major races of the Old World such as the Khoi-San (Bushman-Hottentot), the Pygmy, the Australoid, the Negro, the Mongoloid, and the White. Within each of these major racial groups there are, or have been, smaller entities which may deserve the designation of race in a lesser sense. These smaller entities consist, for the most part, of groups of people reasonably isolated, and developing into local physical enclaves by the three processes, usually linked, of *amalgamation*, *selection*, and *environmental* (in the total sense, including cultural) *response*. At what borderline point such an entity becomes a major race, it is not always possible to say.

Let us consider these three forces—*amalgamation*, *selection*, and *environmental response*. We have already mentioned the first, which is more commonly called race mixture. We have already observed that while blending seems to be the usual result, in some criteria there is evidence of simple Mendelism or the heaping of dominants or recessives. Amalgamation, furthermore, can produce a differential dominance based on age grading; for example, the dominance of hair blondism in infancy, coupled with the darkening of the hair in adolescence and adult life, link blondism with infantile characters. The same is not true of eye blondism, which grows slightly more pronounced with age. At the same time mongoloid morphological characters are more pronounced in infantile hybrids than in the

[3] Hooton, E. A., **HAS**, vol. X, part II, 1932, pp. 42–107.
[4] Unpublished data in author's possession.
[5] Shapiro, H. L., *The Heritage of the Bounty*, pp. 229–233.
[6] Baur, Fischer, and Lenz, *Human Heredity*, p. 176.

adults; the reverse is true of most distinctively white features in combination with those of either negroids or mongoloids. This differential age dominance is, except in the case of blondism, an heritable endocrine function connected with the relative degree of infantilism associated with each of the major racial groups.

Selection is a difficult force to study in man, at least in a scientific sense. But it is without question one of great importance. Sexual selection probably has and always has had a certain application, which may be seen in the current standards of beauty in different countries. The standards of one group may be shifted through the cultural medium to another. But since in any population other than an industrial, civilized one there are few bachelors and few spinsters, sexual selection must have worked slowly in most cases, at least in the sense of an eliminative rather than a segregative principle. Warfare, again, kills off a selected group of males, while celibacy connected with the assumption of religious offices may render genetically ineffective a selected population element.

The most important selection is probably that consequent on changes of environment, by which the selective factor may perhaps be a physiological economy in response to new types of mineral deficiency. This type of selection may have been of profound importance in the evolution of man as a species, as well as of different races.[7] Small, foetalized, relatively weak races may be more efficient and hence more suitable for survival in certain environments than larger, more muscular, and less infantile ones. Small, foetalized, and relatively defenseless mammals develop elaborate social devices by which the solidarity of the group compensates for the deficiency in individual aggressiveness; man on the whole is a social animal comparable in this respect to the Cebus monkey. The type of environmental selection postulated by Marett may have been of profound importance in the evolution of man as a species, as well as of different races.

Another form of selection is intimately concerned with the complexity of the social structure. When a population is stratified into social horizons, this cultural differentiation is often the result of the conjunction of two or more social and hence ethnic groups, from two or more geographical sources. It takes time for cultures to blend and for people who practice these cultures to mix, and if there exists, at the same time, the idea that one group is superordinate and the other subordinate in social values, the social mechanism will often function in such a way as to perpetuate this cleavage. Thus the mixing process will be retarded, and at the same time a difference in the reproductive rates of the two racially identified social horizons may arise.

As a rule, at least in modern times, the group which is considered sub-

[7] Marett, J. R. de la H., *Race, Sex, and Environment.*

ordinate will reproduce with greater fecundity than will the superior class. In this way the upper class will gradually disappear, or else social mobility will gradually replace the upper from the ranks of the lower, and the social distinction will remain, but without racial significance. Thus a differential reproductive rate has, in effect, a selective value, and one population may quietly replace another. Whether or not the replacement is complete, the relative numerical importance of the two genetic strains will have been altered.

Extreme differences in skin color, in body odor, and in face form are more active deterrents to such mobility than are differences important to the anthropologist but not to the public, such as the cephalic index and other measures of head form. Differences of the first class prevent the American Negro from complete absorption into the ranks of the white, for his diagnostic racial characters, unless the negroid factor in the individual inheritance is dilute, are easily noticeable. On the other hand differences in head form are not usually noticed, and a brachycephalic white population may replace a dolichocephalic one by means of social mobility.

So far we have been considering selection within a geographically immobile group, or rather, selection at the geographical point under consideration. But there is still another type of selection which is very important, and that is mobile selection, operating at the point of emigration, the source of population supply. We shall see, in our survey of prehistoric European racial movements,[8] that the Danubian agriculturalists of the Early Neolithic brought a food-producing economy into central Europe from the East. They perpetuated in the new European setting a physical type which was later supplanted in their original home. Several centuries later the Corded people, in the same way, came from southern Russia—but there we first find them intermingled with other peoples, and the cultural factors which we think of as distinctively Corded are included in a larger cultural equipment. The Corded people, therefore, who left southern Russia and moved westward into central and northwestern Europe, were a selected group of people, chosen from a larger and more heterogeneous human storehouse. This situation clearly involves the principle that *people who migrate from an old home to a new do not represent, in most cases, the total or typical physical form of the home land, provided that the new home is different from the old; but they represent a special group selected on the basis of their suitability and opportunity for migrating.* This principle can be clearly seen in the study of modern migrating peoples.

The Poles who came to the United States during the nineteenth century, and the early decades of the twentieth, did not represent a cross-section of the Polish population,[9] but a taller, blonder, longer-headed

[8] Chapter IV.

[9] Rosinski, B., **PAn**, vol. 8, 1934, pp. 42–44.

group than the Poles as a whole. In other words, there was a definite selection of a special physical type which influenced some Poles to come to America and others to stay at home. Dr. Shapiro has found that the Japanese who migrated to the Hawaiian Islands are significantly different in many metrical and morphological characters from their own relatives who remained at home.[10] This was determined not by a study of representative samples, but by the actual measurement of relatives, in Hawaii and Japan.

In the same sense, the Americans of colonial British ancestry are not like Englishmen in the larger sense of the word. The English who went to America in the Colonial period were a definitely selected group—selected on the basis of religion, social and economic position, and geographical distribution. Once in America, under new conditions, comparative isolation, and the intensive cross-breeding of relatively few family lines, this differentiation was accentuated. Once the arable lands of New England and New York State had been cleared and cultivated, the farmers who moved westward into the fertile Ohio Valley, and on successively to Indiana, Illinois, and Iowa, were not typical examples of the total population of which they were drawn. The selection of the mountain men of the Rockies, and of the early cattle rangers of the Plains was even more noticeable.

So far we have been considering selection in migration in reference to the new country settled by the immigrants, but this selection, when the migration occurs in any numbers, has an equally important racial effect upon the old country. The depopulation of Ireland and Sweden through emigration to America must have affected the racial constitutions of these countries, just as the mass exodus of several hundreds of thousands of Germanic tribesmen in the Völkerwanderung period must also have affected northern Germany and Scandinavia.

A lesser selection in scope, but equally important in principle and in effect, is the selection of urban populations from rural sources. Numerous European studies have made it clear that the young men and women who leave their villages to seek a new manner of living in the cities are racially atypical of the village populations as a whole, and that the drainage of these people from the fecund rural districts into the relatively infertile cities has a selective value in the determination of the physical nature of the rural population.[11]

Selective differences in emigration and immigration exist in the cultural as well as in the racial sense. The Corded invaders who moved westward into Europe did not carry all the trappings of Asiatic and south

[10] Shapiro, H. L., **SM**, vol. 45, 1937, pp. 109–118; also, *Migration and Environment.*

[11] Bryn and Schreiner, *Somatologie der Norweger*, pp. 342–344, will serve as an example.

Russian culture with them; they took only those objects which they would find useful in their new environment, and easy to replace from local materials. In the same way the early American plainsman and trapper did not fill his knapsack with lace sleeves, wine glasses, and silver shoe buckles, but carried only such clothing, weapons, and other equipment which he knew would be of service to him. *Later on, after he had settled the new country, the more luxurious trappings of the old culture could follow, provided that he had maintained contact with his original home.*

This last principle again applies to race as much as to culture. The settlers who come to a new country later, after the ground has been explored, are often drawn from a different segment of the original society, and may represent a different racial entity, with different cultural associations and aptitudes from that of the pioneers.

Having dealt with amalgamation and selection, there remains the principle of *environmental response*. That human evolution has been going on ever since the initial acquisition of the distinctive human traits, such as speech, the use of fire, and the making of tools, cannot be denied. Man did not stop evolving once he became a man. We have seen that Pleistocene man, of whatever type, was more primitive in some respects than modern civilized man. The reduction of face size, and especially of the masticatory apparatus, is, for example, one of the most marked and most widespread active human evolutionary trends.[12]

There are other responses, however, which are not necessarily evolutionary, but which must be considered direct reactions to environmental change, in a broad sense. Changes in type and complexity of civilization, acting presumably through nutritional agencies, may serve as environmental stimuli and produce somatic effects. These responses, as observed in modern times, take the form of sweeping trends. The increase in stature which has affected northern and western Europe and much of the New World so profoundly within the last century is just such a trend. That it is a true mass response and not merely a selective process is shown by Bowles's studies of three generations of Harvard freshmen, taking only actual genetic lines of grandfathers, fathers, and sons.[13] That it is culturally motivated, whatever the mechanism, cannot be denied, for it is found only in countries which have been modernized progressively and thoroughly during this period.

The most striking modern stature increase must be that of the English colonists in Queensland, for which there is ample evidence but no available scientific data. The Queenslanders have shot up to an immense height, uniformly and with few exceptions, and have acquired a lanky,

[12] Ashley-Montagu, M. F., **QRB**, vol. 10, 1935, pp. 32–59.
[13] Bowles, Gordon T., *New Types of Old Americans at Harvard.*

leptosome bodily habitus. Since the Queenslanders are essentially pioneers, living largely off the soil, this must be due to direct environmental stimulation in the geographical sense.

Stature increases may be matched with equally marked decreases. During the Dark Ages, from the time of colonization to the sixteenth century, the Icelanders, originally as tall as their Norwegian ancestors, shrank in stature to the size of southern Italians.[14] Climatologists now tell us that this shrinking accompanied a lowering of mean annual temperature, and an increased dampness.[15] Icelandic history adds that it was a period of near starvation. The Greenlanders, who suffered even more from this climatic change, became even smaller than the Icelanders before their extinction.[16] Yet the Icelanders who survived this depression grew rapidly once it was over, until at present they comprise one of the tallest groups in Europe. The population of Iceland has not been materially added to by migration since the initial settlement.

One of the best examples of environmentally conditioned physical stunting is to be seen in the misery area of the Limousin hills in central France.[17] Here isolation, poverty, and the dependence on the produce of an infertile granitic soil seem without reasonable doubt to have been the contributing causes. Mineral deficiency, in the sense in which Marett uses it, may be invoked, as well as malnutrition. Another example of environmental conditioning may be seen in the common level of short stature, for the most part below 160 cm., which extends in a circumpolar zone around the world.

If environment can so demonstrably affect stature, and act with such rapidity (the New Englanders have grown 7 cm. in 100 years), then it is more than likely that it can affect other racial criteria, including head form. The excessive brachycephalization which swept over central Europe in the Middle Ages, affecting especially southern Germany and Bohemia, followed the same pattern as the stature change. Both proceeded as orderly increases at fixed rates of speed. Selection may have been a large contributing cause, through infiltration and differential birth rates. Simple Mendelian dominance of brachycephaly, which has never been demonstrated, may not be eliminated, but it cannot have been the only factor involved. But even if we grant infiltration and differential selection and direct Mendelism, it is difficult to account for the rise in cephalic index in the south German and Alpine region over any level

[14] Seltzer, C. C., unpublished MS. in Peabody Museum. Author's permission.

[15] Brooks, C. E. P., **QRMS**, vol. 47, 1921, pp. 173–190.

[16] Hansen, Fr. C. C., **MOG**, vol. 67, 1924, pp. 291–547.

[17] Ripley, W. Z., *Races of Europe*, pp. 168–171, after Collignon, R., **MSAP**, ser. 3, vol. 1, 1894, pp. 3–79.
Collignon, R., **AG**, vol. 5, 1896, pp. 156–166.

which it had attained in antiquity, historic or prehistoric, unless we place this change at least partly on the basis of a response to environmental stimuli. The food-gatherers of west-central Europe seem to have responded to an earlier and equally extensive brachycephalization during the Mesolithic, a period of profound climatic change; and the parallel modification, millennia later, among civilized food-producers, may, for reasons as yet unknown, have followed a parallel mechanism of change.

All of this leads us back eventually to where we started, when we began to consider the meaning of the word *race*. A race is, in view of this discussion, a group of people who possess the majority of their physical characteristics in common. A pure race, if the term need be used, is one in which the several contributing elements have become so completely blended that correlations fail to reveal their original combinations.[18] At the same time the processes of selection and of response to environmental influences have given the resultant blend a distinctive character.

The longer such a human entity remains isolated, the more distinctive it may become in the racial sense. It may expand numerically, divide, and become a major human stock, while others once much more numerous may become almost extinct, or fully so through absorption. But the most important fact about a race is that it is an entity, however ill defined, which is never static, but always in process of change.

If, as above, we define *race* as a group of people reasonably unified in the physical sense and living in one place, difficulties at once arise. How are we to draw the borderline between that place and the next? Where does one race leave off and the next begin? There are those who assert that a race is merely an artificially assumed point on the smooth and glassy surface of a geographical continuum,[19] for what may be the concentration point for an extreme condition in one criterion will be an intermediate point in others. This assertion is, to a certain extent, true. If we view the panorama of living races on a two dimensional map, we can but agree that a race in this sense is merely a reasonably homogeneous group of people who occupy a given arbitrary point upon a terrestrial continuum. In regions of geographical smoothness one condition blends broadly and gently into another; in regions cut up by geographical barriers, such as deserts or mountains, the contrasts are sharper and the transitions more rapid.

As long as we confine our glance to the surface, we will continue to be faced with this dilemma. But a solution comes with the application of a third dimension, that of history. By means of an historical reconstruction, with numerically adequate and competently documented skeletal material,

[18] Scheidt, W., **ZFMA**, vol. 27, pp. 94–116.

[19] I am indebted for this concept to Dr. George Woodbury.

it should be possible to determine what has happened in most regions occupied by the white race; why present conditions obtain; and what is a suitable classification of existing races, built upon the dual basis of the past and present.

This classification must, of course, meet existing conditions and not be an expression of history alone, or of national ideals. By means of such a classification we may hope to answer the continuum objection, and show which spots on the map do actually represent centers of racial dissemination and which have functioned more characteristically as zones of intermediacy and blending, in accordance with principles which are now beginning to be understood.[20]

But we must remember, at the same time, that zones of intermediacy and blending may change their function without warning and assume the rôle of feeders of racial material to other regions. The interplay of these functions, in accordance with the principles already detailed in this chapter, has produced the racial complexity which characterizes most of the earth, and especially those portions occupied by the more active and vigorous and numerous branches of man, the Negroids, the Mongoloids, and the Whites.

(3) MATERIALS AND TECHNIQUES OF OSTEOLOGY[21]

The materials used in the racial study of European man divide themselves naturally into two classes: (A) skeletal material, including crania, long bones, and other bones such as vertebrae, pelves, tarsals, etc.; and (B) measurements and observations taken on the living. Both are subject to statistical treatment; and both must be employed if we are to succeed in our attempt to trace the racial history of white humanity. In the next six chapters, we will deal almost exclusively with material of the first category.

Museums both public and private, in almost every European country as well as in America, contain thousands of crania and long bones which represent the osseous remains of individuals of every race. Many of these, without doubt the majority, are those of persons of white racial origin. For the purposes of the present study, these skeletal remains assume vastly different values, depending upon a number of circumstances. In the first place, only those which have been measured, described, and published were of any use to the present author, since it has not been possible for

[20] Keiter, F., **ZFRK**, vol. 3, 1936, pp. 40–46.

[21] For an exhaustive study of this subject the reader is referred to the standard text in physical anthropology, Rudolf Martin's *Lehrbuch der Anthropologie*, 3 vols., second edition. The present section is intended merely as a brief statement concerning some of the fundamental uses of osteometric techniques, as well as of the sources and numbers of materials, employed in the present study.

him to travel from museum to museum measuring and observing the unpublished material. The majority of collections are still unpublished, and hence the majority of data is as useless as if they were still in the ground. To make such a measuring trip would probably take the best years of one investigator's lifetime.

The first consideration is, then, whether or not the material has been published. The second is, whether or not it is properly documented as to sex, provenience, and cultural association. A number of older cranial series has been published without regard to sex, which makes measures of variability of slight value, and jeopardizes the use of means. Others include skulls from different localities, vaguely labelled and catalogued, which should never have been put together. Still others, and these are many, were unearthed at a time when the archaeologists had not yet so perfected their techniques that the cultural and chronological associations of these remains could be determined. Still others were brought into museums by amateurs who paid no attention to archaeology.

In many cases it is possible to review the published documents as to archaeological settings, and to revise them in the light of present knowledge, especially when illustrations are given identifying the grave furniture and types of sepulchre. Therefore the number of crania and other bones which may be realigned so as to fit into geographical, cultural, and chronological pigeon-holes is not as small as it might be if this material were gathered without recourse to this salvaging process. The realignment mentioned above is the principle upon which the following six chapters have been constructed. It has involved abstracting single skulls and small series of crania, with or without accompanying long bones, and combining the data so abstracted into statistical series based on an identity of place, time, and cultural milieu. In some cases earlier investigators had already effected this process of compiling and combining in a suitable way, so that much of the labor involved could be omitted.

The materials upon which Chapters II to VII are based consist, therefore, of a number of series of crania, in some cases accompanied by other bones, each series representing a cultural, chronological, and geographical entity, the existence of which seems fully justified in the light of our present knowledge of archaeology and of history. Published materials which cannot be reasonably documented in all of the respects mentioned have been ignored, or used with caution.

The crania which meet these requirements and which represent ancestral strains of the white race are numerous enough to permit a reasonable reconstruction of the racial history of the white peoples; but they are not numerous enough to permit us to be sure that our reconstruction is the only possible one in every place and instance. We therefore present

with some confidence the main thesis of our reconstruction, but we are not confident that it is correct in every period, in every region, and in every cultural unit.

The entire Palaeolithic period in Europe, for example, is represented by no more than one hundred published and documented skulls, while the Mesolithic is represented by a no greater number. Certain Neolithic samples, especially in Egypt, consist of several hundreds of crania, and the same is true in the Bronze and Iron Ages. No craniological series yet published exceeds one thousand adult specimens of a single sex, although several closely approach that figure.

Skeletal material of human and near-human primates, from the Lower and Middle Palaeolithic cultural levels, is derived from chance finds of unburied fossil bones. In Europe, Neanderthal man first buried his dead in such a way that entire skeletons would be preserved for anthropologists of the future. At various points in human history cremation appeared, to confuse and dismay the racial historian; the chief vogue of this science-inhibiting custom began during the late Bronze Age in Europe, and lasted well into the Iron Age.

In our era another force has arisen to prevent the use of skeletal material; this is the practice of burying bodies in Christian and Moslem cemeteries, both of which are inviolate on religious grounds. Even where they are not inviolate, the absence of grave furniture in the tombs of these followers of revealed religion makes looting by archaeologists unprofitable. The only skeletal collections of any abundance in post-Christian times are those derived from mediaeval charnel houses or crypts, especially in South Germany and Austria, and in certain English cathedrals.

From the statistical standpoint our skeletal materials stand in a borderline position. A few series are large enough to permit the exercise of all of the statistical constants of the modern biometric school; most, however, are so restricted in numbers that a simple calculation of means, a simple determination of variability and homogeneity, and an informal comparison and discussion are the only techniques which seem justified.[22] Too great a mechanization would render such series inflexible and destroy much of their interpretive value. To make up for their statistical weakness, their use as context material for cultural and chronological horizons provides a certain strengthening. A series, however small, tells us what is present, but does not tell us what is additionally present, or what is absent. The extent to which small series may be employed in an interpretative sense must depend upon the circumstances.

[22] For a more detailed discussion of the use of statistics in racial studies, see Chapter VIII, section 2.

The number of criteria measured upon the crania used in this survey range from one—almost always the cranial index—to the five thousand of von Török. In combining and reseriating these series I have made no fast rule as to what criteria to admit and what to exclude, but have employed what seemed to be a reasonable number, with especial emphasis upon those which find parallels on the living. For example, I have usually accepted the three principal dimensions of the cranial vault—glabello-occipital length, maximum biparietal breadth, and basion-bregma height; the usual circumferences and arcs of the cranial vault; the minimum and maximum frontal and bizygomatic diameters; the interorbital and biorbital diameters, and the height and width of the orbits; the height and breadth of the osseous nose, the diameters of the palate, and of the foramen magnum; the heights of the face from nasion to menton, and nasion to alveon; the principal dimensions of the mandible, such as the mental height, the breadth of the ascending ramus, and the bicondylar and bigonial diameters. In the rest of the skeleton, I have used almost exclusively the maximum lengths of the principal long bones, such as the femur, tibia, fibula, humerus, radius, and ulna, and then almost entirely for the sole purpose of reckoning stature, by means of the Pearson formulae.[23]

In other words, I have used what I could find in such a way as to derive the maximum useful information from it; I have not concerned myself with techniques or routines which had little bearing on my problem. On the whole I have worried little about technical discrepancies due to differences in measuring methodology; where possible I have followed the techniques approved by Morant, and where possible I have made allowances for such differences as I could readily detect. I do not feel, however, that technical discrepancies in the craniological materials are important enough to make any perceptible difference in my conclusions, either detailed or general. The treatment of the material has been done in such a broad manner that such minutiae are of little importance. Craniology is a more accurate science than is the anthropometry of the living; when we come to the later chapters we may concern ourselves with the question of technique, but for the moment it is relatively unimportant.

[23] See Martin, *Lehrbuch der Anthropologie*, second edition, vol. 2, pp. 1020–1021.

Chapter II

PLEISTOCENE WHITE MEN

(1) INTRODUCING *HOMO SAPIENS*

Man as we know him from the study of modern races is descended from one or more species of a single genus, segregated out of a group of related Old World primate genera which had physically, and hence culturally, taken the first definite steps in a human direction. Members of a number of these genera found that they could cut with the sharp, glassy edge which is formed when flint is fractured, learned the use of fire, and discussed these and other matters with their fellows by means of speech. But all of them, including those destined to take part in the formation of the modern species *Homo sapiens*, remained, like less human primates and other animals, dependent on the natural occurrences of foodstuffs for their continued existence.

Man alone, of these parallel forms, succeeded in breaking loose from the natural limitations of food and climate, and he did this in a number of different ways. One of these was the invention of warm clothing which would permit him to hunt in comfort the numerous arctic and temperate mammals, whose flesh was richer in fats than the meat of his tropical prey; but this was not immediately a greater advantage than the development of a furry coat among the animals which he hunted. Another was the discovery of the principles of reproduction in animals and plants, and the knowledge of how to control this reproduction. This second step, which Childe calls the first revolution, produced of course agriculture and animal husbandry, and out of this dual economy have developed the civilizations of the ancient and modern worlds.

These two primary steps, which were in no sense consecutive, although the first was undoubtedly the earlier, and which had no necessary relationship one to the other, brought about different effects of far-reaching consequence. The first of them permitted the utilization by man of lands which could not otherwise have supported primate life, and also the ability to pass through the arctic barrier from the Old World into America; the second, the intense use of more favored regions, suited for farming and pasture, and the increase in population made possible by the consequent abundance of foodstuffs. These two steps, then, permitted the human species to multiply greatly, and to occupy all of the principal interconnecting areas of the earth, not covered by glaciers or waterless deserts,

and not separated from the mainlands of the two hemispheres by wide expanses of sea.

Long before either of these two steps had been taken, most of the related primate genera and species, which had participated in the earlier discovery and utilization of speech, flint, and fire, had dropped out of the contest. Perhaps the last to disappear was *Homo neanderthalensis*, who became extinct as such in Europe, if not elsewhere, at the time of the last glaciation.

Homo sapiens, then, as we now know him, remained alone to deal with the results of the increasing control over nature which he himself had conjured. But all branches of the species did not participate in these results, while those which have participated have not shared them equally. In the far peripheries of the southern hemisphere, to which man in the earliest stages of culture could retire without encountering great cold, naked hunters and gatherers, such as the African Bushmen, the Tasmanians, the Australians, and the Vedda, have been able to survive in isolation until recent years. While only one, the Tasmanian, is extinct in the unmixed form,[1] the others promise soon to follow. Thus our species is repeating within its own ranks the selective process of elimination which effaced, in earlier times, its non-human competitors.

There is, actually, no real difference between these two cycles of extinction. In the first, although separate species were involved, we now know that at least one of those which disappeared was not pruned off the stem completely; for, as in the second cycle, its disappearance was consummated by absorption coincident with cultural changes, permitting the submerged genetic strain to survive in solution. Human genetic strains, however ancient and however primitive, are very hard if not impossible to eradicate completely, for the simple reason that all human racial stocks are mutually fertile, and men of all races are human.

Nevertheless these racial stocks possess, under varying conditions, very different rates of procreative value. It is a constant phenomenon of human history that a small group of people in a restricted area will, through some stimulus which is probably both environmental and cultural, increase rapidly, expand its boundaries, and inundate new segments of the earth's surface with its progeny. For example, the numerical size of the white race has, since the time of the industrial revolution, increased vastly. The countries in which the new regime was initiated grew much more rapidly in population than did those yet to acquire these cultural innovations. In this manner, emigrants from Europe spread out

[1] A few mixed survivors live on the islands between Australia and Tasmania, and in reservations on the Australian mainland.

into other continents, previously occupied by less economical [2] populations, until they and their descendants had filled most of the available space suited to their powers of utilization. After this, their rate of increase fell. New conditions and new stimuli, provided that they are favorable, produce great increases in a species. Unfavorable ones produce absorption and extinction.

This phenomenon is not confined to human beings, but is a basic principle of biology, by which has been accomplished the spread of all plant and animal forms. Man, whose ancestors were a handful of precocious and biologically successful primates, has multiplied until his numbers are now reckoned in billions. The present numerical proportions of races and of nationalities has no reference to the former numbers of previously existing groups of people, to the importance of these various groups in the history of human racial development, nor furthermore, to their relative numerical values in the future. In the subsequent pages outlining the racial history of the white segment of mankind, this principle must not be forgotten.

This history is, on the basis of present knowledge, entirely confined to Pleistocene and Recent geological time. It is with the earlier of these two segments of the Cenozoic [3] that the present chapter is concerned. In it, as in subsequent chapters, some attempt will be made to place the skeletal remains studied in their proper chronological horizons. With the Pleistocene specimens, this dating must be done primarily by geological means.

Since the primary diffusion of a zoölogical species is almost instantaneous, palaeontologists base their dating of geological horizons on the initial appearance of fossil genera and species. By this means they have divided the Pleistocene period into lower, middle, and upper levels.[4] Glacial geologists, limited to the relatively small portion of the earth's surface which was covered by one or more of the Pleistocene ice sheets, divide it by reference to the four or five successive glacial advances. Unglaciated regions were subjected, during the Pleistocene, to alternations of wet and dry climate, probably correlated with the vacillations of the ice. The pluvial and interpluvial periods so determined form a third means of dating Pleistocene remains. At the moment, a complete harmony between these three systems has not been achieved. Hence the relative dating of fossil human beings found in various parts of the world is not, as yet, wholly possible. For that reason we must proceed with reserve and caution.

[2] In the sense of maximum utilization of the soil. No qualitative inference is intended.

[3] The division between Pleistocene and Recent is here maintained purely for the sake of clarity. The possibility that we are now living in a Pleistocene interglacial is not, by the use of this terminology, implicitly denied.

[4] Hopwood, A. T., **PGA**, vol. 46, 1935, pp. 1, 46–60.

(2) PLEISTOCENE CLIMATE

It is not easy to overemphasize the importance of climate in human history, particularly in the earliest times when man was merely a numerically unimportant parasite in the total fauna. With changes in climate, he was forced to migrate with the animals and plants on which he lived, and at the hunting and gathering of which he was adept. The only alternative was to stay on and adapt his culture to a new food supply, which would need new implements and new methods. On the whole, it was easier to move, even if some of the oscillations were, like those in recent times, rather rapid.

The ponderous ebb and flow of the glaciers caused climatic changes which affected the entire world. With the gathering of vast quantities of ice near the poles, zones of climate shrank inward, converging on the equator. At times of maximum glaciation, wide belts of land bordering the glaciers became treeless, frozen tundras, like the northern rims of Siberia and North America today. During the last glaciation, such a zone included the whole of Europe north of the Alps and Pyrenees, and much of Siberia. Below this stretched temperate forests, with zones of willow and birch, of pine, and of hardwood, and beyond these, temperate, grassy plains, watered by cyclonic rain belts. Still farther away, near the equator, stood tropical forests. The present deserts had shrunk to narrow patches between the grasslands or had disappeared.

As the glaciers retreated, the zones of tundra followed, constantly shrinking as the ice cap thinned. The forest encroached on the tundra belt, and the grasslands likewise moved inward; at the same time the tropical forest shrank, and the land in between two belts of grassland became desert. What had once been the optimum home for food gathering man now became bare and sterile, and remained virtually unoccupied until the rise of pastoral nomadism, with ass and camel, once more made it habitable.

The centers of Pleistocene glaciation were not located exactly on the poles. In the northern hemisphere, the center was in the north Atlantic, with land nuclei in Scandinavia, northern Britain, and Greenland, so that northwestern Europe and northeastern America were covered, while territories of higher latitudes, in eastern Europe and Siberia, and in western North America, were left bare. In Europe, the ice covered, at its maximum, all of the British Isles but the southwestern tip of Great Britain; most of Belgium, Holland, northern Germany, the Baltic States, and Finland, as well, of course, as Scandinavia. Secondary centers of glaciation, based on altitude rather than latitude, lay in the Alps, Pyrenees, and Caucasus, in the Himalayas and Pamirs, in the mountain skeleton of Siberia, and in the Atlas mountains of North Africa.

These ice caps, and the surrounding zones of cold, acted as barriers to the naked hunters of the Early and Middle Pleistocene. In Europe, no sure instance has been established of a Lower or Middle Palaeolithic find in a glacial context; before the first Würm glaciation, human beings and related primates gave the ice a wide berth.

During the entire span of the Pleistocene up to the fourth or Würm glaciation, bands of human beings, probably including both *sapiens* and non-*sapiens* forms, shifted slowly from continent to continent with the changes of climate. During the fourth glaciation, the parts of Europe and Asia immediately south of the ice sheet, and in the tundra belt, were for the first time, under such conditions, inhabited. This was by Neanderthal man, who lived in caves, warmed himself over fires, and could, judging by his tool kit, dress skins, although, in default of needles, he was probably a poor tailor. The European branch of this species was a marginal, primitive form, and barely survived the fourth ice. During the Laufen interglacial, Neanderthal was replaced in Europe by pure and mixed *sapiens* men coming from the east in several waves. With the last major ice advance, Würm II, *sapiens* man stayed on, for by now he had developed the knowledge and skill to make warm clothing, as numerous skin-working tools and fine bone needles attest.

In the meanwhile, other *sapiens* men must have lived in more favorable climates, as much on vegetable food as on meat. Some of these developed the microlithic cultural technique, which involved striking off small blades for composite instruments, and this spread to Europe north of the Pyrenees only after the retreat of the last ice. These *sapiens* men were, as we shall see, quite different from those in the North. The post-glacial movements of human groups completely changed the racial complexion of much of the habitable earth.

(3) *SAPIENS* MEN OF THE MIDDLE PLEISTOCENE

The first appearance of fully or incipiently *sapiens* men in the Old World can now be definitely placed in the Middle Pleistocene, in Europe the time of the second, or great, interglacial. The specimen which has made this allocation possible is Swanscombe man, consisting of a parietal and the occipital bone of one individual from a glacially sealed Middle Acheulean deposit on the second terrace of the Thames Valley in England.[5] These fragments are said to resemble the cranial vault of Piltdown, which is also probably *sapiens* in the same sense, and may be of no greater antiquity.[6]

[5] Swanscombe Committee of the **RAI, JRAI,** vol. 68, 1938, pp. 17–98.
See especially Morant, G. M., *ibid.*, pp. 67–96.

[6] It is becoming increasingly unlikely that the Piltdown mandible is a part of the same specimen as the vault fragments.

Other remains comparable to those from Swanscombe, and also associated with the Acheulean cultural horizon, have been found in various sites in western and southern Europe, but have so far failed to receive full scientific recognition. The best known of these is the famous Galley Hill skeleton, found in the second or hundred-foot terrace of the Thames Valley. Others include the Moulin Quignon mandible, the Clichy skeleton, and the Olmo skullcap. Of these, the most nearly complete,[7] and the strongest claimant for authenticity, is the Galley Hill skeleton, unearthed in 1888.[8] Although the skeleton was removed from near the bottom of an undisturbed gravel layer, by persons fully aware of the importance of its position, most modern writers of the pre-Swanscombe era have refused to accept its authenticity, although the chances of its being later than the gravel from which it was taken were at most extremely slight. In view of the Swanscombe evidence the Galley Hill specimen may now be granted the recognition which it has long merited.

The Galley Hill man was of short stature, about 160 cm. His long bones, which include a humerus as well as a femur and tibia, although robust, were not heavy. The length of the tibia is 77 per cent of that of the femur, and this proportion is modern and European, unlike those of many of the later peoples of the Upper Palaeolithic and Neolithic. From the muscular markings on their surfaces, it is apparent that he was a man of considerable bodily strength, but at the same time of fairly light build. The section profiles of the long bones, the positions of the condyles, and the facets, all bear witness to a life in open country, and to the habit of squatting.

The skull, which is reminiscent in a general way of some living varieties of European man, is extremely dolichocephalic, with a cranial index of 69; although warped by earth pressure, it has not changed its basic form. The length of the vault is very long, 204 mm. as reconstructed by Keith, and the breadth correspondingly narrow. The vault height, known only from the auricular projection since the basal portion of the skull is missing, is on the low side of medium. This skull has an extremely protuberant occiput with the greatest length well to the bottom; a well-developed frontal region, and a moderately sloping forehead. At the same time the forehead is very broad, making the parietal walls nearly parallel. The browridges are of moderately strong development. The face, unfortunately, is missing in Galley Hill as in all similar specimens. Yet the temporal segment of the right zygomatic arch remains, and this, although thin, shows that the arch as a whole was well curved.

Fortunately, more than half of the mandible has been preserved, and

[7] The Clichy skeleton may be more complete, but has not been satisfactorily published.
[8] Keith, Sir A., *The Antiquity of Man*, pp. 178–193.

its conformation makes it certain that there was no prognathism. The body of this mandible is rather narrow and of only moderate symphysial height; the chin of medium prominence judged by modern standards. The ascending ramus is wide, and the sigmoid notch shallow. The teeth, while fully human, retain some primitive features in the development of the pulp cavities, in the length-breadth proportions of the molars, and in their relative size, for the third molar is the largest.

Besides these dental peculiarities and the absence of a marked sigmoid notch, the skull itself possesses certain primitive features. It is thick, and the browridges, although no greater than in many modern examples, form a continuous ridge. The mastoids are small, and the area of temporal muscle attachment large.

Galley Hill man was, without reasonable doubt, an extremely generalized form of ancestral white man. His skull and body bones preserve just that degree of generalization needed to make him the logical ancestor of the Mediterranean race and of all the sub-races related to it.

Although more specimens of this type have so far been found in Europe than elsewhere, it is not possible to suppose that the Galley Hill type of man evolved on European soil. He must have been a transient in Europe, coming in with the retreat of one glacier, and going out again with the advance of the next. When his descendants next appear in Europe, it will be from some other source to which their ancestors had retreated.

Outside of Europe, the earliest known human anatomical specimen is the Kanam mandible from East Africa. This was attributed by its finder, Leakey,[9] to the Lower Pleistocene, which would probably make it older than any of the other known fossil men of Africa, Asia, or of Europe. The Kanam mandible is definitely human; it possesses a chin and its teeth are essentially human in form, although primitive in a number of ways,[10] like those of Galley Hill. It is impossible to determine with any accuracy the racial type represented by this fragment of jaw; especially since, if it possesses the age attributed to it, races in the modern sense cannot have developed very far. However, it could, like Galley Hill, have belonged without difficulty to a generalized ancestral white man, since it lacks prognathism and is modern in shape and size.

Younger than the Kanam mandible, and apparently belonging to the Middle Pleistocene, are four fragmentary skull caps found, likewise by Leakey, in East Africa at the site of Kanjera. These, like the Kanam jaw, have been subjected to the investigation of a British Committee which is not satisfied as to the exact location from which they came. However, as Hopwood has pointed out, the fossils from both the Kanam and Kanjera

[9] Leakey, L. S. B., *The Fossil Races of Kenya.*
[10] Adloff, P., **ZFRK**, vol. 3, 1936, pp. 10–26.

deposits belong to the periods which Leakey stated; namely, the Lower and Middle Pleistocene.

Despite the uncertainty of this situation, in view of their great importance, and the fact that their alleged age has not been disproved, it would be unwise to ignore these East African specimens in a theoretical reconstruction of the history of *Homo sapiens*. It is much more reasonable to give them full consideration and to label the sequence of reconstruction as tentative.

These four fragmentary skull caps found at Kanjera are in such poor condition that it is impossible to give accurate measurements or other details which would fully define the types which they represent. Yet enough pieces have been preserved to make a general estimate. Kanjera man was extremely dolichocephalic, with cranial indices under 70; the skull walls, although thick in three out of four cases, are not covered with heavy muscular markings, as in the case of non-*sapiens* types of fossil man.

The foreheads are prominent; the frontal lobes of the brain well developed, as in any modern group; the whole occipital region is extremely protruding, and the occipital lobes strongly developed and very symmetrical. This fact, along with other features of the brain deduced from a study of the endocranial casts,[11] leads one to the conclusion that these specimens belonged to a very long-headed form of *Homo sapiens*, very similar to Galley Hill, and like the latter could without difficulty have been ancestral to at least one part of the present white racial stock. One small piece of malar bone is all that remains of the faces of these four individuals. This fragment includes a well-developed canine fossa, which again is certain proof of its human character. A small piece of femur with a strongly developed pilaster is also fully human, but cannot serve to designate any single racial group.

(4) NON-*SAPIENS* PLEISTOCENE FOSSIL MEN

Not demonstrably older than the Pleistocene fossil men discussed in the last section are the remains of an increasingly large number of non-*sapiens* specimens from all three continents of the Old World.[12] These include two separate genera, *Pithecanthropus* and *Sinanthropus*, and four species of *Homo—soloensis*, *heidelbergensis*, *neanderthalensis*, and *rhodesiensis*. The exact relationships between these groups is in dispute, but it is apparent that they may be grouped in at least two evolutionary levels, with Pithecanthropus and Sinanthropus in the lower bracket. Despite their allocation to separate genera, these two are, in many respects, very much alike. Furthermore Rhodesiensis and Soloensis resemble each other, and together

[11] Elliot-Smith, Sir G., *The Stone Age Races of Kenya*, Appendix B.

[12] The extensive literature on these fossil groups need not be cited here. Except in the case of Neanderthal, they have little bearing on the subject of this book.

are not very different from the numerous and variable Neanderthaloid group.

These fossils, whatever their internal classification, may be considered a separate class of highly evolved, humanoid primates. Within this class there are differences of evolutionary status, and differences in type of specialization. As a whole, however, they differ from both early and

FIG. 1. NEANDERTHAL MAN IN MODERN DRESS.

MacGregor's restoration of La Chapelle aux Saints, provided with hat, hair, and clothing by the artist. Although we do not know that the reconstruction of the soft parts is accurate, nevertheless the facial features were probably essentially human. This picture serves to illustrate the fact that our impressions of racial differences between groups of mankind are often largely influenced by modes of hair dressing, the presence or absence of a beard and clothing.

modern *sapiens* man in the possession of a flattened, gorilloid skull vault, with a strong supraorbital torus, an extremely sloping forehead associated with a low vault height, and a strongly girded brain case, in which, in the more primitive species, the maximum cranial length passes from glabella to an occipital torus, while the maximum breadth lies between the mastoid crests. Even in the more evolved species in which the brain size equals or exceeds that of modern men, the same gorilloid structure to a large extent persists. The faces of the few specimens which still possess them are of extreme length and breadth, and the subnasal portions excessively large in comparison to the brain case; these faces are flat, and that distinctive

human feature, the canine fossa, is lacking. In the case of most known Neanderthals, the molar teeth have fused roots and enlarged pulp cavities, while the dental borders are even, and the canines not interlocking.[13]

The dating of the various fossils mentioned above is in most cases under dispute, but there is no valid evidence that any of them are earlier than the Middle Pleistocene. Only *Homo neanderthalensis* in some of his more highly evolved forms is known, however, to have extended into the Late Pleistocene. Aside from all biological considerations, the time element is sufficient to destroy the hypothesis that members of this heavy brow-ridged group could have evolved directly into the earliest known form of *Homo sapiens*. It is possible that these species represent a survival of an ancestral stage through which *Homo sapiens* had in earlier times passed, and that they were, during the Pleistocene, themselves passing through a tardy process of evolving, but this explanation is not the only one that may be presented. The sexual differentiation and luxuriance of gorilloid characters which these species possess may conceivably never have been found in the direct ancestor of *sapiens* man.

(5) THE NEANDERTHALOID HYBRIDS OF PALESTINE

In western Europe, Neanderthaloid skeletal material begins to appear in the second interglacial, with the Heidelberg jaw,[14] and is followed, during the early part of the Riss retreat, by the Steinheim and Ehringsdorf crania. The whole of the third interglacial, and the advance of Würm I, belonged to Neanderthal men, and not a single *sapiens* skull has been found, in Europe, dating from this long time expanse.

The Neanderthal group was extremely variable, and showed within its ranks clear evidence of evolutionary change in a human direction. On the whole, the western European specimens formed a marginal, and relatively primitive, geographical sub-group of the species. The center of its dispersion probably lay farther east, as did, one may suppose, that of the Mousterian flake culture with which the Neanderthal species seems to be basically associated.

In Palestine, which falls on a periphery of this cultural range, excavations in caves near the Sea of Galilee and Mount Carmel have revealed a number of Neanderthaloid skeletons which are different from those in Europe,

[13] The condition known as taurodontism is not as uncommon as has been supposed, and can no longer be cited as an impediment to the relationship of Neanderthal with other types of man. For a discussion and bibliography on the subject of taurodontism, see Galloway, A., *The Skeletal Remains of Mapungubwe*, pp. 127–174, in Fouché, L., *Mapungubwe*.

[14] Current scientific opinion in Germany tends to place Heidelberg in the first interglacial.

and others which are, in fact, only partly Neanderthaloid.[15] The materials from the Mountain Carmel caves, situated in a late Middle Pleistocene setting, corresponding to the latter part of the third interglacial in Europe, were found imbedded in a breccia thick with Levalloiso-Mousterian implements. It is with these late Mousterians, who showed atypical racial features, that we are at present concerned.

In one of the Mount Carmel caves, that of Tabun, was found the skeleton of a small woman, fully Neanderthaloid, and associated with it was a male mandible equal in size to that of Heidelberg, but possessed of that human feature, a chin. In a nearby grotto, the Mugharet es-Skhul, were the remains of a number of individuals, including three male crania sufficiently complete for reconstruction and measurement. A preliminary publication [16] of three of these skulls, and of the long bones of the same and other individuals, gives us a reasonably accurate idea of their position in the human family tree. Originally considered members of the Neanderthaloid species, they are now known to be fully human, although preserving a number of unmistakable Neanderthaloid characteristics.

The leg bones of the Skhul people are long and slender, the femora heavily pilastered, in contrast to the Neanderthaloid form. The feet are fully human, but lack the reduction found in the middle phalanges of modern races, while the heels are short. The humeri are likewise long and slender, the radii and ulnae straight, instead of being bowed as with Neanderthal man, including the Tabun female. The hands of Skhul men were broad and large.

In the Skhul pelves, definite Neanderthaloid features appear; the entire structure is lower and narrower than those of most modern men. The Tabun woman's pelvis, on the other hand, is quite different from other Neanderthaloids, in the possession of a long, plate-like pubis, which is an ape-like character. The vertebral column of the Skhul men, while human, and possessing a lumbar curve of *sapiens* character, is short in the cervical region. The total height of the cervical vertebrae is only 55.7 mm., as contrasted with a mean of 68.4 mm. for modern man. Thus the Skhul men were short-necked, and in this respect possessed a Neanderthaloid trait. In comparison with Neanderthal man, the Skhul thorax was flat, while that of the Tabun woman retained the barrel-like earlier form. The ribs of the Skhul men are variable in cross-section; some are flat and ribbon-like, as in modern man, others are thick and rounded, as with

[15] Keith, Sir A., "A Report on the Galilee Skull," in Turville-Petre, F., *Researches in Prehistoric Galilee.*

Keith, Sir A., and McCown, T. W., **BASP,** #13, 1937, pp. 5–15; also "Mount Carmel Man," etc., *Early Man,* Phila., 1937, pp. 41–52. (Other notices superseded by the last two mentioned.)

[16] Keith, Sir A., and McCown, T. W., **BASP,** #13, 1937, pp. 5–15.

Neanderthal. The latter form is also associated with the Upper Palaeolithic European men,[17] whose relationship to the Skhul people will be treated later. The stature of the Skhul males was tall, ranging from 173 to 179 cm., while that of the females, estimated from long bones, was short, 158 cm. The sex differentiation thus revealed is great.

In the skull, Skhul man is definitely intermediate between the Neanderthal and *sapiens* groups, but much closer to the latter, so that its inclusion in the living species cannot be denied. The skulls of the three males are extremely large. In length, they equal Galley Hill, but far exceed it in breadth; the vault height of two specimens, #5 and #9, measured from the ear holes, is equal to that of Galley Hill, but the third, #4, is as low as with true Neanderthals, while the extreme breadth of this specimen acts as a compensation, permitting a greater capacity than with the other two. In vault form, then, two are mainly *sapiens*, while one appears, from the measurements, to be largely Neanderthaloid. The capacities of these three skulls are 1588, 1600, and 1616 cc., respectively, much greater than those of Galley Hill or others of his type, and greater than those of most living men. At the same time, they exceed most Neanderthal figures. In brain size as in stature, Skhul man exceeded either Neanderthal or *Homo sapiens* as previously known.

The best preserved and most complete specimen, #5, is a heavy, thick skull, with heavy browridges, which do not, however, attain a maximum Neanderthaloid development. The greatest length falls higher, in the rear, than with the Neanderthals; although the occiput is protruding, it is not conical in form, as with many Neanderthal specimens. The vault is well-arched, the lambdoid region slightly flattened, and the forehead no more sloping than in many modern *sapiens* crania.

The face, while large, fails to attain the gorilla-like proportions of Neanderthal, and falls within the modern range in height and breadth. The interorbital distance is, comparatively speaking, great; the upper borders of the orbits straight. Both the maxillae and mandible are of great size and robusticity, exceeding most modern specimens, and the alveolar prognathism is excessive. The mandible has, however, a fully human chin, and the teeth are, like those of the Tabun specimens, not taurodont. The palate, viewed from below, while large, is long in proportion to its breadth, unlike Neanderthal in which the breadth exceeds the length. The foramen magnum, like that of Neanderthal, is long and narrow.

Although the anthropometric position of the Skhul crania will be discussed later in more detail, it is worth noting at the moment that in most characters capable of measurement the #5 specimen falls between *Homo*

[17] Aichel, O., *Der deutsche Mensch*, p. 30.

sapiens, as exemplified by Galley Hill and later examples of the same type, and Neanderthal, as known from the totality of that species.[18]

Keith and McCown have demonstrated, beyond serious doubt, that the Skhul skeletons are intermediate between *Homo neanderthalensis* and *Homo sapiens*, and that Neanderthal must therefore be included among the ancestors of modern races. Thus the opinions of Hrdlička, Aichel,[19] and others, expressed earlier on the basis of equally valid but less striking evidence, are at last, in one sense or another, substantiated. We now know that the Neanderthal strain did not become extinct, but passed over into the genetic stock of modern man. If this occurred once, it could have occurred a number of times. The field is now open to discover survivals of non-*sapiens* accretions in modern races in other parts of the earth. This privilege must, however, be used with caution.

(6) UPPER PALAEOLITHIC MAN IN EUROPE, THE EVIDENCE AS A WHOLE

The next step is to examine the evidence which reveals the racial composition of Upper Palaeolithic man in Europe. Until the discovery of the Swanscombe fragments, these were the earliest *sapiens* remains which were definitely datable to the satisfaction of all interested scientists, and immune to the doubts which had thrown all supposedly earlier finds into the shade.

The first Upper Palaeolithic people, the bearers of the earliest phase of the Aurignacian culture, arrived in Europe during the middle of the Laufen interglacial, between the retreat of Würm I and the advance of Würm II. On the basis of accurate Scandinavian chronology, it is possible to set the end of the Upper Palaeolithic in western Europe with more accuracy; 11,800 B.C. seems to mark a turning point, with the migration of the reindeer northward, and the first introduction of Mesolithic culture. In view of the present differences of opinions between geologists, it seems unwise to set even a tentative date for its inception. In any case, the time that elapsed during the Upper Palaeolithic must have provided ample room for change in some of the more fluid physical characters of a people, especially if they have been subjected to rigorous climatic conditions and specialized diets.

We must not place too much importance on fine differences in stature as a means of determining genetic affinity or distance, especially over periods of tens of thousands of years. Head form, too, although it changes with much less speed than stature, for it is not directly concerned with

[18] Figures for the latter obtained from Morant, G. M., **AE**, vol. 2, 1927, pp. 376–377.
[19] Hrdlička, A., *The Skeletal Remains of Early Man*, **MCSI**, vol. 83, 1930.
Aichel, O., *Der deutsche Mensch.*

gross size, nevertheless responds to the stimuli which control it, and we must not be surprised if long heads have in some instances become round heads during the course of hundreds of generations.

In studying the remains of Pleistocene and of post-Pleistocene man, therefore, we must be careful not to confuse characters which are of racial importance with progressive modifications which may occur, in response to cultural changes, within any group. Such modifications are especially concerned with the jaws and teeth. Among the more primitive white peoples, such as Berbers and Albanian mountaineers, the incisors of the two jaws meet edge to edge, as they did among most of the mediaeval inhabitants of western Europe. Under modern conditions this changes rapidly to an overbite, and is frequently accompanied by a narrowing of the palate and crowding of the teeth, making modern orthodontia profitable. This shifting of the bite affects also the position of the lips and changes the entire facial expression.

Another modification which seems to proceed with some rapidity is the enlargement of the masticatory muscles under sub-arctic conditions. As these muscles enlarge, the angles of the lower jaw become everted, the zygomatic arches expand laterally, and often the brain case becomes keeled in response to an increase in temporal muscular attachment. At the same time both the mandible and the palate develop tori. These correlated changes act without regard to race since they are apparently functional adaptations. They also act with some rapidity, for the mediaeval Icelanders acquired them in less than four centuries.[20] These occur in varying degree among some of the later Upper Palaeolithic European skulls, as well as among Eskimos and modern Siberians.

We must be particularly careful, therefore, in studying the remains of Upper Palaeolithic man, to remember that his time span was unquestionably greater than the totality of time which has elapsed since it ended. We must also remember that the men who conquered the cold lived under new and rigorous climatic and dietary conditions, and that these conditions must have exerted a strong influence upon the more plastic elements of their bodily form. Therefore, metrical and morphological differences in physical type which appear, during the course of these millennia, may imply, in some instances, a response to environment rather than a diversity of origin.

From all of the regions in Europe which we know to have been inhabited during the Upper Palaeolithic period, over one hundred skulls which have been disinterred at one time or another, during the last century, have been called to the attention of persons competent to determine their age. Of these hundred or more skulls, however, only sixty odd have been

[20] Hooton, E. A., **AJPA**, vol. 1, 1918, pp. 53–76.

measured and published. We have, in this group, a large enough series to merit treatment by biometric methods, in contrast to the remains of earlier non-human species, which consist for the most part of single specimens, and may, therefore, be approached from a morphological and anatomical standpoint alone.

Unfortunately, these crania have not been drawn in equal proportions from all the countries in which Upper Palaeolithic cultures are represented. By far the largest number come from France, where they were preserved in caves, and where archaeological interest, over an entire century, has been greater than in any other European country. A smaller number come from England, Spain, northern Italy, Germany, Czechoslovakia, Poland, and Russia. In studying this group of skulls as a whole, we must remember that the western European element is over-weighted.

Morant, the present leader of the English biometric school, has contributed a valuable statistical study of these skulls.[21] (See Appendix I, col. 1.) To twenty-seven, which he personally remeasured, he adds twenty-five measured by other investigators. These fifty-two skulls, of unquestioned geological age, form the nucleus of his study. Of these skulls, seventy per cent come from the first, or Aurignacian period.

Although in the later sections of this chapter we shall examine the position of these skulls singly by regions and by periods of time, it will be profitable, for the moment, to follow Morant in treating this group of crania as a single unit. Despite the fact that the Europeans of the Upper Palaeolithic were probably the product of more than one invasion, and despite the fact that they lived through a long period of time, and covered a geographical range which includes the greater part of the continent, the first of several striking results of Morant's study is the discovery that this composite sample is little more variable in the totality of its features than one would find in any large cranial collection of post-glacial men, unified in space and in time. Von Bonin, working with the long bones and extremities, obtained exactly the same result.[22]

It is amazing to find that the Upper Palaeolithic men were less variable, on the whole, than the inhabitants of London who were buried in plague pits during the seventeenth century. They were less variable than the modern rural population of a small section of Carinthia, and only a little more so than the skulls of the extremely isolated Greenland Eskimo, whose time span covered at most a few centuries, or the Egyptians who were buried at Gizeh between the twenty-sixth and thirtieth dynasties.

The great complexity of race in modern Europe is largely due to post-Pleistocene migrations from other continents, and the retention of local

[21] Morant, G. M., **AE**, vol. 4, 1930–31, pp. 109–214.
[22] Bonin, G., von, **HB**, vol. 7, 1935, pp. 196–221.

types in modern populations reflects the greater isolability in small regions of farmers than of hunters. But the Upper Pleistocene people were by no means completely homogeneous, as will be shown later by an examination of individual crania, in their chronological and geographical contexts.

Since, as Morant has shown, this total Upper Palaeolithic group is unified enough to be considered a single population,[23] we may proceed to generalize about the traits which most of the members of this group possess in common. The first and most notable of these is the extremely large size of the brain case, larger in most cases than Galley Hill or most modern men, and comparable in size to Skhul. This is found in all but a few of the skulls, whatever the actual dimensions and forms. The cranial indices, however, are very variable, ranging from sixty-five to eighty-five, and this variability is too great to imply a single homogeneous type.

In these skulls the males are easily distinguished from the females, for there is a greater difference between the sexes than is usual among more recent groups of man. The same is true of long bones and stature.[24] This implies, of course, a stronger development of secondary sexual characteristics. In the male skulls the bony markings are all pronounced, the browridges are as a rule heavy, the faces are excessively broad, with flaring zygomata. The upper face height is variable—medium to short in most individuals, but in others quite long.

One of the most distinctive characteristics of most (but not all) of these skulls is that the orbits are very broad and very low. The nasal skeleton is almost always prominent.[25] The nasal root, although deeply overhung by glabella, is still high, and the osseous nasal profile is as a rule straight or convex. The nasal spine is sharp and the lower border well marked. The nose, on the whole, is leptorrhine to mesorrhine.

The lower jaw presents just as marked an individuality as does the cranium. This bone is deep, wide, and heavy, with flaring gonial angles and a prominent chin. The palate is rather wider than those of most living men, although the teeth are not of excessive size. If one judges the face form from the calvarium alone, the great breadth of the face, coupled with a variable length, yields in most cases a low upper facial index, placing these skulls in the euryene category. If, however, one calculates a total facial index, many of these skulls are leptoprospic, for the great height of the mandibular symphysis compensates for the shortness from nasion to alveolar point. This condition, in which the lower part of the

[23] By the word population we do not, necessarily, mean a human aggregation of single racial origin. What we mean here is a group of people, unified by interbreeding and forming a geographical and social unit. Such a population, of course, may have a multiple origin.

[24] Bonin, G., von, *op. cit.*

[25] The Grimaldi "negroids" form an exception.

face is exaggerated, is one of the chief diagnostic features of this type of man, and a suggestion of it may still be seen among some of the living peoples of northern Europe.

In the totality of facial features, with a few exceptions, the Upper Palaeolithic people may be said to have resembled modern white men. Some, however, probably looked like a certain type of American Indian, notably that of the North American Plains, and of the Onas and Tehuelche of southernmost South America. This comparison, we must remember, is wholly morphological, since we do not know Upper Palaeolithic man's pigmentation, hair form, or hair distribution.

The skeletons of the Upper Palaeolithic people vary in size by subperiods, as will be shortly demonstrated, but as a whole the group was tall, long-limbed, and slender, with narrow hips, broad shoulders, and large hands and feet. On the whole, the limb bones were not excessively robust, and the limb ratios, determining the relative lengths of arm and leg segments, and of arms to legs, were unstable.

The mean stature of the males was about 173 cm., of the females 155 cm. The men were taller than the means of any modern European countries, with the exception of Iceland and Montenegro, but not taller than modern Americans. The women, on the other hand, were actually small. The equivalents of these mean statures are, in feet and inches, but five feet nine, and five feet one and a half. Galley Hill man, by comparison, was only five feet two.

Morant, in his statistical study, compared his Upper Palaeolithic sample with a long list of post-Pleistocene cranial series. He found that the early group exceeded all of the later ones by a wide margin in seven measurements,[26] while it reached the limit of recent human means in six others.[27] This mass deviation would, in Morant's opinion, place Upper Palaeolithic European man at one end of the scale and the rest of humanity, white and otherwise, all of lesser antiquity, at the other.

It is possible to quibble with Morant, and to discover small series or subseries which contradict this finding. For example, the Ona skulls from Tierra del Fuego,[28] a series of Bronze Age crania from Esthonia,[29] and of

[26] Horizontal circumference, glabello-occipital length, sagittal arc from glabella to opisthion, nasio-bregmatic arc, internal biorbital diameter, bizygomatic diameter, and length of the foramen magnum.

[27] Transverse circumference, bregma-lambda arc, biasterionic breadth, bimaxillary breadth, orbital breadth. These five, according to Morant, fall within 1 mm. of the greatest post-Pleistocene means. Orbital height, he finds, is .7 mm. shorter than the lowest comparative mean.

[28] Morant, in his group "Fuegians, pooled," mixed Ona skulls with those of the smaller and quite different Yaghans. If one abstracts the Ona crania from Lebzelter's original tables, he will find that the European Upper Palaeolithic means of Morant are essentially duplicated.

[29] Friedenthal, A., ZFE, vol. 63, 1931, pp. 1–39.

Iron Age ones from the Norwegian coast,[30] are equally large in facial as well as cranial dimensions. But these exceptions in no way invalidate his discovery, that the Upper Palaeolithic people, despite their generalized European facial appearance, were separate in many metrical characters from most of living, or for that matter pre-Aurignacian, *sapiens* men. The reason for this deviation is not difficult to discover, but we must approach the obvious conclusion slowly, in order to make sure of an accurate reconstruction of prehistoric events.

(7) CHRONOLOGICAL AND GEOGRAPHICAL DIFFERENTIATION OF THE EUROPEAN AURIGNACIAN GROUP

The Aurignacian flake culture,[31] with which the Upper Palaeolithic period in Europe began, was not a single unit throughout its time span, but seems to have been composed of several separate entities derived from more than one non-European source.

The first Aurignacian level in Europe, the Chatelperronian, is represented by three skeletons only. These include the two "negroids" from the Grotte des Enfants, Grimaldi, near Mentone, and Combe Capelle. Of the three, the Grimaldi pair may have been the older. Except that they belonged to the earliest Aurignacian period, a more exact estimate of their age is not possible.[32] These were the remains of an adult female and an adolescent male. Disregarding for the moment their racial affinities, we may be sure that they were fully *sapiens*, and that they resembled Galley Hill in stature and in gross cranial vault form. The vault dimensions, however, are smaller. They thus show nothing whatever of the great size and robusticity of the crania belonging to the total Upper Palaeolithic group, and nothing of the latter's exuberance of bodily growth.

In other respects they were apparently somewhat negroid, in the sense that they possessed features divergent from the modern white standard in a modern negroid direction.[33] These include the virtual absence of browridges, a sharp bowing of the frontal bone, low, broad nasal bones, a guttered lower border of the nasal opening, alveolar prognathism, a large palate, and large teeth. The orbits, furthermore, are relatively narrow, the face both absolutely short and narrow. The long bones show a difference, however, in limb proportions between these people and

[30] Schreiner, K. E., **SNVO, II, #11**, 1927, pp. 1–32.
[31] Garrod, Miss D. A. E., **RBAA**, Pres. Ad., Sect. H., 1936, pp. 155–172.
[32] Hopwood, A. T., *op. cit.*
[33] Verneau, R., "Anthropologie," in *Les Grottes de Grimaldi*, vol. 2, fasc. 1.
Keith (*Antiquity of Man*, p. 67) and Morant (**AE**, vol. 4, 1930, pp. 116–119) deny this negroid character completely, Morant on the grounds of faulty restoration, which exaggerated the prognathism of the adolescent male.

Galley Hill, for the distal segments are relatively long, and the arms long in relation to the legs.[34] In this as in the possession of long heels [35] the Grimaldi specimens are truly negroid, and again upset the unity of the total Upper Palaeolithic sample.

There is no type of man more completely *sapiens* [36] than a negro. The two Grimaldi specimens, in being partially negroid variants or relatives of the Galley Hill group, are entirely divorced from the line or evolution which produced either the Palestinian Skhul people or the later European Aurignacians. In this respect the argument as to how much or how little negroid they actually were, is of no importance.

Whence they came to Europe, in the van of the Upper Palaeolithic migrations, is likewise not, at the moment, worthy of extensive argument. They must have come from Africa or southwestern Asia, but until others of the same type have been found, the problem will remain open. They may represent an early negro-white mixture, or a generalized proto-negroid in the process of specialization.[37] They are probably too late, however, in time, to have been contemporary members of the generalized stock which may have been mutually ancestral to the negroes and whites.

The study of the third specimen, the male skeleton of Combe Capelle, is more pertinent to our present problem. Like the two Grimaldi negroids, it deviates completely from the body of Upper Palaeolithic crania and long bones in the distinctive features of the main group. Although as long as the mean for the total series, the cranial vault is considerably narrower, somewhat higher, and smaller in capacity. In the details of vault form, it is essentially similar to Galley Hill, but is actually narrower even than Galley Hill itself.

The Combe Capelle face is the earliest which can be definitely associated with a Galley Hill type of vault. Here it differs again from the middle Aurignacians to follow, for the bizygomatic and bigonial diameters are as small as those of most modern long-headed white men, and the face, orbits, and mandible are narrow. The nasal opening is wider than those of most later Upper Palaeolithic European crania but the nasal bones are European in form. There is no prognathism and the subnasal segment of the face is not exceptionally large. Like Galley Hill, Combe Capelle man was short, with a stature of 160–162 cm.

It will be necessary, in studying the crania of the remainder of the Aurignacian, to combine all sub-periods, since no distinction has been made in the majority of cases. Furthermore, the crania which might

[34] Bonin, G., von, *op. cit.*, p. 205.
[35] *Ibid.*, p. 215.
[36] As opposed to Neanderthaloid.
[37] Montandon, G., **RA**, vols. 4–6, 1936, pp. 105–139.

have been Solutrean are also included. The present survey, then, includes the famous Crô-Magnons of France, and the Moravian mammoth hunters, who lived in the open and buried their dead in sepulchres built of mammoth jaws and shoulder blades.

Despite the general homogeneity of Upper Palaeolithic man, these two groups, the western and eastern, may be shown to have differed from each other in certain well-defined ways. Both were tall, with statures well

RECONSTRUCTIONS FROM PALAEOLITHIC CRANIA

FIG. 2. NEANDERTHAL MAN. (LA CHAPELLE.)

FIG. 3. CRÔ-MAGNON MAN. (THE OLD MAN OF CRÔ-MAGNON.)

Reconstructions, under the direction of Professor V. Lebzelter; Fig. 13 by Herr Fahrwickel, Fig. 14 by Herr E. Grenzer. **MAGW**, vol. 65, pp. [4], [26].

over 170 cm., and in this likeness of growth they segregate themselves from the few early Aurignacian representatives which we have studied.

Both the western and the eastern type possess the special characteristics of Upper Palaeolithic man which have been described earlier. But there is one principal feature which separates them—the cranial index. The Crô-Magnons, who were concentrated in France, range in this ratio from 69 to 85, whereas the eastern group, including the Russian skulls, ranges from 64 to 76. The mean index for the French skulls equals 76, while that of the eastern group, representing the same period of time, is 71. In other words, the eastern Aurignacian type, like Galley Hill and Combe Capelle, was purely dolichocephalic, while the Middle and Late Aurignacians of France include among their numbers a brachycephalic element, which reaches the high limit of 85 in the male skull, Solutré #2.

The western group has been named Crô-Magnon after a senile male skull which is usually taken as the standard example of this type, and which possesses the most specialized Upper Palaeolithic features in an exaggerated manner. Skulls of this type have a rather flat vault, the lowest and broadest orbits in the entire series, and short, extremely wide faces. Their nasal apertures are of medium width, and their nasal bones highly curved and projecting.

The most brachycephalic skull shows, of course, quite a different conformation of the cranial vault. It belongs to the curvoccipital type, with a gently rounded rear profile. This Solutré #2 specimen is a large skull, and belonged to a tall man. Its face, however, shows the typical Crô-Magnon features of flaring zygomata and wide jaw, combined with extremely low orbits. The Crô-Magnon character of this face, while marked, is not as clearly shown as in the dolichocephalic examples, for the fuller bulge of the temporals obscures it. The Crô-Magnon type, in the widest sense, therefore, includes both long-headed and round-headed examples with transitions in between, and the features which differentiate it are just as pronounced in the roundest skulls as in the more numerous narrower ones.

Let us turn to central and eastern Europe, and study the purely long-headed examples from this part of the continent. In general, they resemble an exaggerated and leptorrhine Combe Capelle, with the low orbits, wide faces, and heavy jaws found in excess further west. A few skulls deviate in various ways from the standard, however; of these three are notable, Brünn #1, Lautsch, and Předmost #3.

Brünn #1, which lacks a face, but possesses a mandible, is, in vault form and size, and in the lower jaw, the duplicate of Combe Capelle. Lautsch, which has a face, belongs partly to the same general class, but is broader. Its face, however, is narrow, and in this conforms to the Combe Capelle type. On the whole, the eastern skulls, while subjected to the same influence which brought about an increase in gross size and osseous extravagance in the Crô-Magnons, nevertheless cling closer to the older Galley Hill form, and were not affected by whatever factor caused the brachycephaly in some of the western specimens.

The third of the not fully typical eastern crania, Předmost #3,[38] is of great value, for it reveals in a certain manner the reason for the general peculiarities of the Upper Palaeolithic series as a whole, and for their separation, shown by Morant, from the bulk of living humanity. This reason is simply that Předmost #3 resembles Skhul #5 very closely, both morphologically and metrically, while neither of these two specimens deviates notably from the Upper Palaeolithic metrical means.

[38] This may even have been associated with a Solutrean culture.

On the whole, the Upper Palaeolithic group, including Předmost #3, is intermediate between the Galley Hill-Combe Capelle type and the Neanderthals, as known to us from the European Neanderthaloid group.[39] In the first place, the horizontal circumference, taken above the browridges, ranges from 538 to 563 mm. in male Neanderthals. The Upper Palaeolithic means is 549.1 mm., the individual figure of Předmost #3 is 556, that of Combe Capelle, 527 mm., which would be nearer a modern dolichocephalic mean. In face breadth, the Neanderthal figure is represented by La Chapelle aux Saints with 152 mm., and the Le Moustier adolescent with 148 mm. The Upper Palaeolithic mean is 142.8 mm., Předmost #3 is 144 mm., and Combe Capelle 137 mm. Again, Combe Capelle represents modern European man, and the Upper Palaeolithic group takes an intermediate position.

The same intermediate position is found in a number of other characters, including the vault breadth and height, the minimum frontal diameter, the widths of the orbits, and the distance between the orbits. In individual cases, such as Předmost #3, the upper face height is intermediate also, but in the group as a whole it is not, for the shorter dimension prevails. The same is true of the nasal dimensions in which Upper Palaeolithic man is not perceptibly Neanderthaloid. The cranial lengths of the Upper Palaeolithic group are no greater than those of Combe Capelle and Galley Hill; in fact, frequently shorter. The reason for this may be that the equivalent Neanderthaloid diameter includes the browridges, which, when eliminated, make the brain length somewhat less than that of Galley Hill.

The stature of the Upper Palaeolithic group equals that of Skhul; the sex differentiation in size is the same; the pelves are similar, and so is the rib section. The hands and feet are likewise large.

If the European group, with the exception of Předmost #3, is less Neanderthaloid looking than Skhul, this is not surprising. The distance in time between the two was probably as great as or greater than that between the beginning of the Middle Aurignacian and the present. Furthermore, we have been comparing European Upper Palaeolithic skeletons with those of European Neanderthals. While the Aurignacian hunters of Europe may possibly have absorbed some of the local Neanderthal survivors, it is likely that the main accretion of this element took place farther east,[40] and we do not know that those so accreted were as specialized in a non-*sapiens* direction as the European examples.

[39] Measurements from Morant's tables in **AE**, vol. 2, 1927, pp. 376–377.

[40] The Aurignacian culture does not seem to have absorbed the local Mousterian of western Europe, except in a few doubtful instances. See Leakey, L. S. B., *Stone Age Africa*, pp. 185–186. On the whole, the theory that European Neanderthals had become extinct, or had departed before the arrival of the Aurignacians, is not invalidated by the discovery of the Neanderthaloid characters of Middle and Late Aurignacian man.

In admitting the partially Neanderthaloid character of Upper Palaeolithic man (which is no new theory), we must accept at the same time some genetic principles which apply to modern primary crosses between distant races,[41] as well as to these ancient interspecific mixtures. Although blending is the rule in most characters, simple dominance appears in a few; while major changes in size appear through this mixing. The stature of the hybrids far exceeds that of their parents, and through the general genetic upset, the brain size becomes greater than that of the earlier purely *sapiens* stock.

It must be admitted that there is an alternative interpretation of the Neanderthaloid traits of Upper Palaeolithic man. That is that he represents a stage in the evolution of Neanderthal in a *sapiens* direction; that different branches of the Neanderthaloid stock evolved into *sapiens* men at different times; and that the Swanscombe—Galley Hill—Kanam—Kanjera stock went through this process at a much earlier date than did the group under consideration.

For the purposes of the present study, it makes no difference whether the early *sapiens* stock, fully evolved by the Mid-Pleistocene, had passed through a Neanderthaloid stage in its previous history, or had evolved directly from some less gerontomorphic and more gibbonoid ancestor. The question which is at the moment pertinent is, are the Skhul—Upper Palaeolithic peoples to be considered Neanderthaloid-*sapiens* hybrids, or simply evolved Neanderthaloids, in which case the hybridization connecting the Upper Palaeolithic people with modern Europeans would have occurred later? All of the existing evidence, of somatology as of archaeology, points to the former hypothesis, which we have accepted, in lieu of further information, as one of the main theses in our reconstruction of European racial history.

Returning to the specific consideration of the Upper Palaeolithic European group, we find that the difference between the eastern and the western Aurignacians, which consists, most demonstrably, of the brachycephalic tendency in the latter, has not been explained. It might, however, have been due to a differential mixture between *sapiens* and more than one Neanderthaloid strain. The Neanderthaloids in Europe, who lived in the western part of the continent, varied in cranial index from 67 (Gibraltar) to 77 (La Quina), and were not far from the French Upper Palaeolithic mean of 76.

When measured from ophyron, a point on the frontal bone behind the browridges, the crania of these Neanderthals have the following lengths: three males, 193, 186, 187; three females, 185, 183, 186 mm. These are

[41] Shapiro, H. L., **MBM**, vol. 11, 1929, pp. 1–106; *The Heritage of the Bounty*, pp. 217–233.

shorter than the French Upper Palaeolithic means, taken from the same point, of 195.6 mm. for males, and 188.6 mm. for females. The cranial indices calculated from these lengths are, in five out of eight Neanderthal cases, above 80.0. Thus there was, in the Neanderthal group as we know it, a brachyencranial, or brachycerebral, tendency in brain form which, with a reduction of browridges, might, in mixture, have caused brachycephaly in some of the hybrids. That it may have done so in the case of the French brachycephals, notably Solutré #2, which has a cranial length of 182.5 mm., is by no means more than a suggestion.

As the reader will have gathered from the preceding pages, the study of race in Europe during the advance of the last ice is not a simple matter, nor one to be solved lightly. It will be of help to study parallel developments in other quarters, especially in Africa.

(8) UPPER PALAEOLITHIC HUNTERS OF NORTH AFRICA

During the Late Pleistocene, at the time of the Würm glaciations in Europe, northern Africa, including the present Morocco, Algeria, and Tunisia, enjoyed a cool climate and an abundant plant life; making an admirable home for human beings. Fortunately, many Late Pleistocene skeletons from these countries have been studied, and we are able to supplement our information from Europe very greatly by comparison.

During the Upper Palaeolithic, there were three cultures in North Africa which existed contemporaneously as geographical units; the Capsian, covering a restricted range in Tunisia and eastern Algeria; the Oranian, a related culture extending over the provinces of Alger and Constantine, and into Morocco; and the Aterian, along the Moroccan seaboard.

The Capsian and Oranian were cultures basically related to the Aurignacian of Europe, but which contained throughout their history a microlithic blade element which was destined to move northward, after the end of the glacial period, and to invade Europe as the Tardenoisian. The Capsian had probably moved westward along the southern Mediterranean shore from the East; the Oranian was nothing but a western extension of the Capsian; while the Aterian was a protracted survivor of the Mousterian, which developed its own peculiarities as time went on, and was gradually crowded to the Atlantic seaboard by the Oranian.

It is at present believed that North Africa, during the Late Pleistocene, was a marginal area of refuge, and not a highway of cultures. Gibraltar served less as a bridge than as a barrier. Nothing can better attest the passive cultural rôle of North Africa during this period than the fact that the Aterian, a Mid-Pleistocene culture, was allowed to elaborate its own special technique long after the Mousterian, from which it sprang, had passed out of existence elsewhere.

That the earlier phases of the Capsian and Oranian, coming directly after the Mousterian, were comparable in time to the Upper Palaeolithic cultures of Europe, such experts as Menghin, Obermaier, and Leakey are unanimous,[42] while Miss Garrod, on the basis of Vaufrey's work, would make them later.[43]

We can only, at this point, agree with Menghin that while the exact time correlation of North African and western European Late Pleistocene industries is still floating, they may be considered roughly parallel. At present, the general agreement is that the essential elements of both European and North African Upper Palaeolithic cultures came from the east, and had, at least in part, a common origin.

So far, all of the human remains of the Late Pleistocene from North Africa come from the Province of Constantine, where most of the archaeological work has been done. The total of these skeletons probably reaches one hundred, but, unfortunately, less than half of them have been fully preserved or competently studied.[44] They come for the most part from two great sites, Afalou bou Rummel, and Mechta el 'Arbi. The former is Oranian, the latter Capsian.

Afalou bou Rummel is an Early Oranian site. Within this early horizon, Arambourg distinguishes two levels, a lower and an upper. The lower may be correlated with the Early Aurignacian of Europe, by one system, or with Middle and Late Aurignacian, according to another.

The lower level is represented by the skeleton of a single adult male, to whom we shall refer by his catalogue number, #28. Number 28 was a short man, about 161.5 cm. tall, equivalent in stature to Galley Hill, Combe Capelle, and the male negroid from Grimaldi. His skull differs greatly from the others taken from the upper level of the same site. It is ovoid in shape, hyperdolichocephalic, and low vaulted; it possesses a sloping forehead, a large U-shaped palate, and high orbits. It is only moderately massive, and is about equal in this respect to Combe Capelle. This skull is that of a generalized white type, and can be placed without much difficulty into the general class of Galley Hill and Combe Capelle. Like the latter, its nasal aperture is wide, its index chamaerrhine.

Forty-nine other crania have been taken from the upper lenses of the Early Oranian culture level at Afalou bou Rummel. These correspond

[42] Menghin, O., *Weltgeschichte der Steinzeit*, pp. 34–35.
Obermaier, H., **AAnz**, vol. 7, 1931, pp. 259–265.
Leakey, L. S. B., *Stone Age Africa*, pp. 105–111.
[43] Garrod, Miss D. A. E., **RBAA**, Pres. Ad., Sect. H.
Vaufrey, R., **Anth**, vol. 43, 1933, pp. 457–483.
[44] But two satisfactory accounts have been published:
Part II of *Les Grottes Palaeolithiques de Beni Séghoual*, by Boule, Vallois, and Verneau.
Cole, Fay-Cooper, **LMB** #1, 1928, Section on skeletal material.

closely in physical type to Middle and Late Aurignacian man in western Europe, but the two groups are not identical. Like Crô-Magnon, all of the Afalou skeletons studied were tall, with an estimated male mean falling between 171 and 175 cm., according to different methods. Their limb proportions, with long distal segments, are like those of many of the Crô-Magnon group; while their hands and feet, similarly, are both longer and broader than those of most Europeans. The combined height of the vertebrae show that their bodies, as well as their legs, were long, and the total bulk of a typical male, in good condition, must have been great.

A high ratio between the length of the collarbone and that of the upper arm (clavico-humeral index) reveals that they had broader shoulders than those of most modern white men, a feature which has been also noticed on the Chancelade and Obercassel skeletons, and perhaps is equally true of the European group as a whole. The pelves are high and have narrow openings; the feet are highly arched, with well-developed heels; and the size and muscular markings of the long bones differentiate the males from the females clearly. All of the bodily traits of these men are shared by Crô-Magnon, and all are, in a general sense, European.

The Afalou crania have been exhaustively described and thoroughly illustrated. In general, they are very large, low-orbitted skulls, thick-boned, and marked in high relief for muscular attachment. The browridges form a heavy jut, even greater in most instances than those of the Crô-Magnons. Behind a salient glabella the forehead slopes in all instances. Vertical foreheads, frequent among modern whites, especially females, and present in some Crô-Magnon individuals, do not occur here. The union of the parietal and occipital bones is always marked by a lambdoidal depression, or flattening,[45] while below this depression the occiput is usually bun-shaped and projecting. The mastoids are strongly developed, and the thickness of the vault is greater than that of modern man, but no greater than with Crô-Magnon.

Metrically, the male skulls (see Appendix I, col. 3) are practically identical with those of the total European series, except that they are slightly shorter and higher in vault dimensions, while the upper face is a little shorter. In these divergences from the total European group, they resemble the western branch, or Crô-Magnons. The cranial indices of 23 males range from 70 to 80, with a mean of 74.8; while the female figures are: range 70 to 84; and mean 75.7. Both in range and in means of head form, the Afalou series equals that of Crô-Magnon.

The nose of the Afalou type is perfectly European in bony conformation.

[45] This feature is extremely common among living North African tribesmen, and among crania from the Canary Islands. See Coon, C. S., *Tribes of the Rif*, p. 312. Hooton, E. A., *The Ancient Inhabitants of the Canary Islands*, p. 134.

The paired nasal bones unite at a sharp angle, without trace of flattening, while the bridges are high and mostly convex. The nasal spine is strong and projects far forward. The nasal index, which lies just over the border of chamaerrhiny,[46] furnishes a real metrical difference between Afalou and Crô-Magnon. The elevation of the index is due to a shorter height as well as to a greater width. Not one of the Afalou skulls is actually leptorrhine. This feature, combined with the sloping forehead and heavy browridges, serves to differentiate the types in the two continents. The Afalou mandible, furthermore, is extremely broad, deep, and heavy. In the possession of a pronounced chin greater than those commonly found among the living, it is clearly opposed to any known Neanderthal form. However, it resembles the Neanderthaloids in one feature; the bigonial breadth is frequently greater than the mandibular length, a condition rare in *Homo sapiens*, and not even found in Skhul.

In the Crô-Magnon series, the combination of a short, broad upper face with a long cranial vault has often been called "disharmonic," and it has been asserted that this condition is the result of mixture between a longer, narrower-faced dolichocephal and a shorter, wider-faced brachycephal.[47] In the European series, although both long and round skull forms occur, there are not enough crania which still possess facial bones to make a statistical analysis of this point valid. But in the Afalou series, where the same set of conditions is duplicated, such an analysis is possible.[48] Out of nine dolichocranial skulls, four have upper facial indices in the broad category, while fourteen out of eighteen of the rounder-headed examples are broad faced. The tendency toward a broad upper face form, then, is borne predominantly by the meso- and brachycranial element in the group. If this is true for the Afalou series, it is probably equally valid in the Crô-Magnon group.

Two of the Afalou skulls, however, present the "disharmonic" combination of a hypereuryene face with a long skull form. In explaining this anomaly we must remember that an extreme width of the face is sex-linked in both the Crô-Magnon and Afalou series; it is a manifestation of the extreme ruggedness and luxuriance of muscularity which the males of both series manifest, and is lacking, as a rule, among the females.

One other peculiarity which is common to both the European and the North African Upper Palaeolithic peoples is a very low orbital index. This again lends itself in the second series to statistical analysis. Only three out of eleven dolichocranial skulls are chamaeconch, while fourteen out of

[46] Mean for 21 males—53.1; Nose Ht. = 52.7 mm.; Nose Br. = 28.4 mm.

[47] Hooton, E. A., *Canary Islands*, pp. 204–207.

[48] The coefficient of mean square contingency between the cranial index and the upper facial index, calculated with nine boxes, equals .53.

eighteen of those with higher cranial indices fall into this low-orbitted category.[49]

Hence we may deduce that the two parallel series, Crô-Magnon and Afalou, consist in each case of a Galley Hill-Neanderthal mixture as a base, with which is associated a variant tendency to round-headedness. To this is linked an extremely short, broad upper facial form, with a heavy lower jaw, and wide, low orbits. At the same time, certain differences, such as the nose form, definitely prevent the assumption that the two are identical, and make it extremely unlikely that the two met, after their initial separation, during the entire span of the Late Pleistocene.

Other facts strengthen this conclusion.[50] The Afalou people knocked out one to four incisor teeth from the jaws of each person of either sex, between the ages of fourteen and sixteen, apparently as a puberty rite. Tooth knocking is unknown in Europe before the Mesolithic,[51] although finger-chopping, during the Upper Palaeolithic, is indicated by the outlines of mutilated hands on the walls of the caves. Therefore, if the Crô-Magnon people observed bloody puberty ceremonies, as is quite possible, they must have removed some less tell-tale part of the anatomy than the teeth. While this bit of cultural evidence renders the theory of physical contact between the two groups unlikely, it does not necessarily affect the problem of relative age. We still do not know whether the Afalou men, whose sequence of types parallels that in western Europe, were contemporaneous with their kinsmen to the north, or later than them to arrive.

From a study of these presumably Pleistocene Algerians, we are able to confirm the conclusions reached in the preceding section, and to amplify them. A fully *sapiens* individual, comparable to Combe Capelle in every important respect, preceded, in time, a group of overgrown, large-headed and wide-faced Neanderthal-*sapiens* hybrids. This latter type, like Crô-Magnon and unlike the people in central and eastern Europe, bore a tendency to brachycephaly. That Crô-Magnon and Afalou men were the parallel termini of similar movements, and not way stations on a single line of migration, is probable. In view of the earlier evidence of a similar mixture in Palestine, and of the general center of Aurignacian activity in that neighborhood, it may be considered likely that the second pair of parallel movements proceeded westward from that general quarter. The earlier waves which brought Combe Capelle and Afalou #28 must have

[49] C = .47. In this contingency table, of 6 boxes, the progression is constant, and of undoubted significance.

[50] It was at one time thought that the presence of caries in a small percentage in the Afalou teeth made them later in age than the Europeans. However, the two Solutrean or Magdalenian skulls from Le Roc, Charente, were also carious.

Boule, M., and Vallois, H., **BIPH,** #18, 1937.

[51] See Chapter III, p. 68, footnote 27 (Ofnet).

come from a different center. Whether the Crô-Magnon and Afalou people derived their brachycephalic tendencies from parallel mixtures at the terminal points of invasion or brought them with them in the first place, cannot be determined without further evidence.

(9) AURIGNACIAN MAN IN EAST AFRICA

The Aurignacian culture, the racial connotations of which we have just reviewed in Europe, Palestine, and, in the guise of Capsian and Oranian, in North Africa, also extended southward to East Africa.[52] Here, as in Algeria, microliths were present in the midst of other forms more typical of Europe and western Asia.[53] While the correlation of the pluvial periods of East Africa with the glacial phases farther north is still under discussion, it is probably safe to conclude that the Kenya and Tanganyika Lower Aurignacian was roughly equivalent in time to Upper Palaeolithic horizons elsewhere, although the Upper Aurignacian may have lasted much later, in view of the fact that East Africa was a racial and cultural frontier and a marginal area.

The remains of six Upper Aurignacian men have been discovered in the two colonies named. Five of these were exhumed by Leakey at Gamble's Cave, Elementitia,[54] and the sixth is the famous Oldoway skull discovered by Reck in 1914.[55] Two of the Gamble's Cave specimens, and Oldoway, which are all masculine, consist of nearly complete skulls and long bones. The others from Gamble's Cave are too fragmentary to be of much value.

In general, these specimens belong in the purely *sapiens* category, as represented by Galley Hill, Kanjera, Grimaldi, Combe Capelle, and Afalou #28. At the same time, however, they differ from all named in one important respect—they are extremely tall, with statures of 177, 179, and 180 cm., which even exceeds the Crô-Magnon and later Afalou figures, but the great stature is unaccompanied by the broad shoulders and bodily bulk of the hybrid Europeans and North Africans. The long bones are very slender, and the hands and feet small and narrow.

The same principle of attenuation applies to the faces. In all of them, and especially in Oldoway, the faces are extremely narrow, and very long, especially in the upper segments. The browridges are weak, the zygomatic arches feebly developed, the mandibles light and slender, with narrow bigonial diameters, and weak, although positive, chins. The orbits are high and narrow, and the noses likewise. The Gamble's Cave skulls are lep-

[52] Leakey, L. S. B., *Stone Age Africa*, pp. 38–74.
[53] Garrod, Miss D. A. E., **RBAA,** Pres. Ad., Sect. H.
[54] Leakey, L. S. B., *The Stone Age Races of Kenya*, pp. 47–56; *Stone Age Africa*, p. 172.
[55] Reck, H., *Oldoway, die Schlucht des Urmenschen*, Leipzig, 1933.
Mollison, T., and Gieseler, W., **VGPA,** vol. 3, 1929, pp. 50–59, 60–67.
Boule, M., and Vallois, H., *L'Homme fossile d'Asselar*, **AIPH,** Mem. 9, pp. 60–64.

torrhine, leptene, and leptoprosopic; Oldoway is mesorrhine, and hyperleptoprosopic. The two Gamble's Cave skulls are orthognathous, but Oldoway possesses considerable alveolar prognathism.

In vault size, these crania resemble Combe Capelle and Afalou #28, rather than the European and North African crania of later Aurignacian and Oranian date. Oldoway and Gamble's Cave #4 are higher and narrower than the European Upper Palaeolithic mean; Gamble's Cave #5, which is the skull of an adolescent, is shorter, higher, and nearly as broad. The foreheads are gently sloping and rounded; the occiputs projecting, but without the lambdoidal flattening which characterizes the European crania. The total impression is one of thinness and delicacy.

In the morphology of the head and face, these three specimens are not exactly alike. Gamble's Cave #5, which has a cranial index of 74, is nearest to the European standard; while the two others, Gamble's #4, with an index of 71, and Oldoway, with 64.5, are decreasingly so. But they are closer in many ways to modern European racial types than are the Upper Palaeolithic skulls. They seem, however, to have been subjected to some influence which has made all extremities, including both limbs and face, extremely long and thin. One may compare this with the modern changes in the English stock settled in Queensland.[56]

Both of the Gamble's Cave skulls seem to be fully or nearly "white" in the skeletal sense, but Oldoway is, in a way difficult to analyze, perceptibly negroid. Many modern tribes of East Africa, including the Somalis and Masai, and the upper classes of others such as the Bahimas, show today the same general features which are found in these pluvial period skulls, particularly in Oldoway. These modern Hamites have long spindly legs, thin hands, and narrow wrists, while their bodies are correspondingly thin and attenuated. Their skulls are universally long, smoothly contoured, and lacking in strong muscular markings. Their noses are narrow and often highly arched, their jaws light and narrow, their faces long and thin. All of these modern East African Hamites show a certain amount of negroid admixture, but their skulls are considerably smaller than the three from the pluvial period.

On the basis of head size, if for no other reason, these skulls cannot be dismissed as intrusive burials from later periods. Mollison, who has studied the Oldoway skull, is convinced that it is as fully fossilized as the bones of the other fauna of the period to which it is now attributed.[57]

[56] I can find no adequate references to this phenomenon, but common observation attests its existence.

[57] And not of the Lower Palaeolithic horizon to which it was first ascribed, Boule, M., and Vallois, H., **AIPH**, Mem. 13, 1934, pp. 60–64.

Mollison, T., and Gieseler, W., **VGPA**, vol. 3, 1929, pp. 60–67.

Leakey, L. S. B., *Stone Age Africa*, pp. 172–173.

The only reasonable conclusion is that the modern Hamite is ancient in East Africa, and is at least partially descended from this ancestral, purely *sapiens*, form. At the same time we may be equally sure that modern post-glacial Europeans of Mediterranean type did not come from this particular corner of Africa; that whatever the date of these specimens in years, East Africa was not, in Upper Palaeolithic times, the center of Mediterranean racial evolution.

Neither, it would appear, was the Sahara; so far the archaeologists have not found evidences of the Upper Palaeolithic Capsian culture in the central zone of the desert itself, where there is at present a gap between the Levalloisian and what appears to be an early, arrow-chipping Neolithic in Capsian tradition. The Capsian apparently came to North Africa from the east, and the mid-Sahara may have served even during Pleistocene times as a dividing line between white and negroid humanity, just as it does today. At the same time it is likely that the Empty Quarter of southern Arabia even in those days functioned as a barrier between Mediterraneans and Veddoids.[58] Although what are now the edges of deserts may have been breeding grounds of white humanity during the Pleistocene, the great deserts themselves have always been racial frontiers.

(10) THE MAGDALENIANS

In concluding our survey of human racial types and racial movements during the Pleistocene, it will be well to return from Africa to study that group of Late Palaeolithic cultures found in Europe and northern Asia, and collectively known as Magdalenian.[59]

The Magdalenian was the longest of the Upper Palaeolithic cultural divisions in time span, lasting in western Europe from the peak of Würm II until about 11,800 B.C., while in parts of eastern Europe where it is found it may have been even older. It marks the culmination and decline of the second Würm advance, and is the first instance, except for that of the geographically limited Solutrean culture, in which we are sure that *sapiens* man was exposed to the full force of a glacial climate. During the Magdalenian as during the Solutrean, the great abundance of fine needles and other tailoring implements in archaeological deposits attests the close cultural adaptation of these people to the cold conditions under which they hunted.

During the Magdalenian there must have been numerous population shifts and migrations with the changing climate, as the men followed the

[58] See Chapter XI, section 6, for a discussion of the Veddoids in southern Arabia.

[59] A separate study of race during the Solutrean has been omitted, since there are no skulls which all authorities accept as definitely belonging to that short and far from widespread cultural phase. Those of Předmost, including #3, might well be Aurignacian; those of Le Roc fit more easily, from the craniological standpoint, into a Magdalenian category.

herds of reindeer which formed their chief article of diet. We know that at one time reindeer crossed the Pyrenees and wandered into Spain, where the Magdalenian hunters followed them. In general, however, Spain, like Italy, was a marginal area, relatively sheltered, in which local cultures of Aurignacian origin persisted, with the addition of microlithic elements, presumably from Africa.[60] These southern inroads were, however, but minor Magdalenian incidents. It was a sub-glacial tundra culture, and stretched eastward across Siberia, where numerous sites have recently been discovered.

Despite its great time expanse, the Magdalenian is represented by fewer skeletal remains than is the Aurignacian. The finds seem to be limited entirely to the west[61]—to France, England, western Germany, and Spain.[62] Moving eastward from Germany, we find no more human remains until we arrive in northern China.

The number of fully authenticated Magdalenian skulls, about twenty-five, might be large enough to warrant separate statistical study if all of them were well documented. As matters stand, we are able to discuss but a few of them in any detail. In general, they are as variable in the cranial index as those of the Middle and Late Aurignacian, although in western Europe the head form in this later period seems to run somewhat longer.

Some of the skulls, as typified by the famous Chancelade and by the male from Obercassel, show, however, something new—a so-called Eskimoid modification of the masticatory apparatus. This consists of an even greater widening of the zygomatic arches than had been previously known; a flattening of the parietals, an enlargement of the area of temporal muscle attachment, and a keeling of the cranial vault. These features are accompanied, most markedly in the Chancelade specimen, by

[60] It is the modern tendency to deny African influences in the Spanish Upper Palaeolithic. Vaufrey (**Anth,** vol. 43, 1933, pp. 457–483) shows that the Capsian did not enter Spain, nor did it extend westward of Central Algeria. The Oranian was formerly called Ibero-Marusian until it was determined that this, too, was absent from Spain. Nevertheless Spain was influenced, during the Upper Palaeolithic, by *some* microlithic industry, which must have come from points south and east, of the same general type as that which went to Kenya as Wilton, to Egypt as Sebilian, to Palestine as Natufian, and to North Africa as Capsian and Oranian.

[61] Two Russian skulls from Undori may be Magdalenian and not Aurignacian. Talko-Hryncewicz, **PAn,** vol. 1, 1926, p. 208.

Field, H., **AA,** vol. 38, 1936, p. 277.

Pavlow, A., **AnthPr,** vol. 3, 1925.

[62] The Spanish material is particularly unsatisfactory. Dr. Obermaier in 1924 rejected all previously studied finds except for two cranial vaults which had been cut down to serve as drinking bowls, a femur, and a few teeth. (Obermaier, H., *Fossil Man in Spain,* pp. 288–290.) Two large series from Segovia, published by Dr. de las Barras de Aragon (**AMSE,** vol 12, 1933, pp. 90–123) as Magdalenian or Mesolithic, include one trephined skull. Our earliest positive case of trephination in Europe dates from the Late Neolithic. Furthermore, one of the sites contained pottery.

a great eversion of the gonial angles, a prominence of the malars, and a consequent flattening of part of the facial plane.

This new adaptation, common among living Eskimos and Siberians, has been interpreted by a number of authors [63] to mean that the Magdalenians as exemplified by Chancelade were the ancestors of the living Eskimo, whose forebears moved northeastward as the ice retreated, and eventually crossed Behring Straits. But several objections have been raised to this identification. The nasal bones of Chancelade, in the first place, which were broken off and lost soon after the skull had been discovered, were very highly arched, projecting, and even hawk-like.[64] They were thus extremely European in form, and not typically Eskimoid or mongoloid in the modern sense.

On cultural grounds, Birket-Smith and Matthiassen have postulated that the Eskimos are not the product of a simple eastward migration from Asia, but that their origin is linked with that of the American Indian.[65] It may be true that the similarities between Eskimo and Magdalenian culture are due to convergence, although this thesis has by no means been finally established. On physical grounds as well, evidence has been adduced to show that the Eskimo is really close to the American Indian.[66]

The question of Magdalenian-Eskimo relationships, in any case, is part of the general problem of those between Upper Palaeolithic man of the entire northern zone, and the origin of the American aborigines as a whole. It is too early at present to settle either.

Returning to Chancelade, we see that this individual differed in many ways from the standard Upper Palaeolithic mean. His face was very long, like that of Předmost; his orbits were high, and, like those of Combe Capelle, narrow. None of the other Magdalenian skulls which simulate him in "Eskimoid" character diverge so completely from the total group, and hence Chancelade had been set apart by many as a separate race. Unlike the Late Aurignacians, he was a short man, about 160 cm. high, and his stature would be usual among most of the present inhabitants of the Arctic circle. His extremities, with his short heel bones, would also not be alien to the latter.[67]

Besides Chancelade and other individuals which approximate his type in varying degrees, the true Crô-Magnon of Aurignacian tradition survived unchanged into the Magdalenian. The Laugerie Basse cranium

[63] Morant, G. M., **AE**, vol. 1, 1926, pp. 257–276, is the latest and most exhaustive exposition of this view.

[64] We must thank Sir Arthur Keith for this discovery. An old and rare photograph, reproduced on page 395 of *New Discoveries*, establishes this point definitely.

[65] Birket-Smith, K., **PICA**, 1930, pp. 470–475.

[66] Shapiro, H. L., **PSC**, 1934, pp. 2723–2732; **APAM**, vol. 31, 1931, pp. 345–384. Seltzer, C. C., **HB**, vol. 5, 1935, pp. 313–370.

[67] Bonin, G., von, *op. cit.*

could well fit into such a series. Others, such as the Le Placard cranium and skull C from Aveline's Hole in England,[68] represent an unreduced survival of the brachycephalic element in the Crô-Magnon complex. Still other skulls are smaller than the Upper Palaeolithic standard, show a reduction in browridges and in malars, and anticipate the general reduction in size and in ruggedness which was to alter profoundly some branches of the Upper Palaeolithic stock in Europe and Asia after the close of the Pleistocene. It is important to learn that this reduction had already begun as early as the Magdalenian, and that at that time there was no geographical difference between those which were and were not affected by this incipient tendency.

During the Magdalenian, then, the internal diversity of Upper Palaeolithic European man became more noticeable than before. Some of the examples which are left to us represent a continuation of pre-existing Aurignacian forms, others show a modification found among living peoples of the Arctic, while still others anticipate the size reduction of the Mesolithic. We may, if we like, attribute these differences to local segregations and modifications, but since our knowledge of race in Magdalenian Europe covers so small a portion of the area in which that culture existed, it is perhaps more reasonable to postulate new movements as well as local survivals and changes.

(11) UPPER PALAEOLITHIC MAN IN CHINA

Our knowledge of the eastern distribution of Upper Palaeolithic man during the height of glaciation has been enormously extended by recent discoveries made by Dr. Pei, by the late Dr. Davidson Black, by Père Dr. Teilhard de Chardin, and by Dr. Franz Weidenreich, who have established the presence of several varieties of Late Pleistocene *sapiens* man, including the European type, in China and Mongolia.[69]

At Chou Kou Tien, close to Peiping, the discoverers of *Sinanthropus* have also found three well-preserved skulls, with one mandible and most of the accompanying long bones, in limestone pockets of late glacial debris, which includes Upper Palaeolithic implements analogous to European types. The preliminary descriptions of the cultural remains would suggest late rather than early Upper Pleistocene age. One of these skulls, the one with the mandible, seems, upon preliminary examination, to resemble

[68] The skulls from Aveline's Hole, Kent's Cavern, and Gough's Cave, were described by Keith, who considered them to be of Mesolithic age (*Antiquity of Man*, p. 407; *New Discoveries*, pp. 406–421); but Clark, an outstanding authority on the Mesolithic in northwestern Europe, indentifies them as Magdalenian (Clark, J. G. D., *The Mesolithic Age in Britain*, p. 107).

[69] The first discovery of this nature was of a *sapiens* tooth from the Sjara-osso-gol Deposits in Mongolia. Black, D., **BGSC**, vol. 5, 1927, p. 285.
Also, Keith, Sir A., *New Discoveries*, pp. 250–251.

the European Upper Palaeolithic group very closely, and especially the male of Obercassel; it has also been compared to Ainu crania. A second skull greatly resembles that of a modern Eskimo, while a third may be compared to the racial type which invaded Japan during Neolithic times.[70]

The importance of these skulls cannot be overemphasized. They indicate that in eastern Asia as well as in Europe, the Late Palaeolithic group was already racially complex; that peoples of European type stretched across the entire width of the northern half of the Eurasiatic continent; and that the mongoloid family of races had already begun its characteristic development. By means of this knowledge we may explain, at least in part, the enigma of the Ainu, a large-headed, broad-faced white group living on the outer periphery of eastern Asia. At the same time fresh light is thrown upon the human materials which may have taken part in the early peopling of America.

(12) SUMMARY AND CONCLUSIONS

Although the Pleistocene men are long dead, and factory workers scurry to their labors where the Magdalenian hunters once impounded reindeer, the problems of human racial origins, and of human development during the Pleistocene, are still of great importance. On the foundations of our knowledge of Pleistocene man, in Europe, in Asia, and in Africa, must be built the interpretation of later and more complicated racial movements, racial survivals, genetic continuities and genetic changes. For this reason it seems better advised to state without trepidation the reconstruction of Pleistocene racial events which the facts themselves suggest, than to defer to more cautious and perhaps wiser opinions.

These conclusions, which are by no means novel,[71] may be stated briefly:

(1) *Homo sapiens* was fully evolved as early as the mid-Pleistocene, if not earlier.

(2) The earliest *Homo sapiens* known, as represented by several examples from Europe and Africa, was an ancestral long-headed white man of short stature and moderately great brain size.

(3) The negro group probably evolved parallel to this white strain,

[70] I am indebted for this information to Dr. Franz Weidenreich, who has given me permission to publish this preliminary notice. These comparisons are tentative and the reader must await Dr. Weidenreich's definitive publication for more detailed and more exact information.

[71] Aichel, Marett, and most recently Krogman, take stands essentially similar to the following.

Aichel, O., *Der deutsche Mensch*, pp. 12–36.

Marett, J. R. de la H., *Race, Sex, and Environment.*

Krogman, W. M., "Cranial Types from Alishar Hüyük," in H. H. von der Osten, *The Alishar Hüyük*, Oriental Institute Publication #30, part IV, pp. 213–293.

from a related *sapiens* ancestor. At what point the ancestors of negroes and whites diverged is not known.

(4) During the Middle Pleistocene, if not at other times as well, a mixture took place between early white dolichocephals and one or more non-*sapiens* hominid species, including *Homo neanderthalensis*.

(5) The result of this mixture was the development of a reasonably stable hybrid race, which was characterized by an excess of size, both of brain case and of bodily bulk. Although differing metrically from the rest of *Homo sapiens* as a whole, its character was nevertheless mainly *sapiens*, and only to a small extent Neanderthaloid or non-*sapiens*. Within the *sapiens* species, its relationship was with the whites.

(6) This predominantly *sapiens* character may have been partly the result of convergent evolutionary tendencies on the part of the non-*sapiens* ancestor.

(7) Modern white men must include both individuals and racial entities which respectively possess and lack this non-*sapiens* strain, since all branches of the white stock did not mix with it.

(8) On the basis of Palaeolithic cultural phenomena, one cannot assume that the non-*sapiens* element absorbed through mixture was less intelligent, or, in the social and intellectual sense, less human, than the original *sapiens* species. Modern European races which possess the former element show no signs of intellectual inferiority, or of any other discernible mental differences.

(9) Most if not all of the basic variations of bodily and cranial form, including brachycephaly, which occur among white men, already existed during the Late Pleistocene. The materials for the differentiation of white races and sub-races in post-glacial times were all present.

SAPIENS MEN, FROM THE SECOND INTERGLACIAL TO THE POST-GLACIAL MESOLITHIC

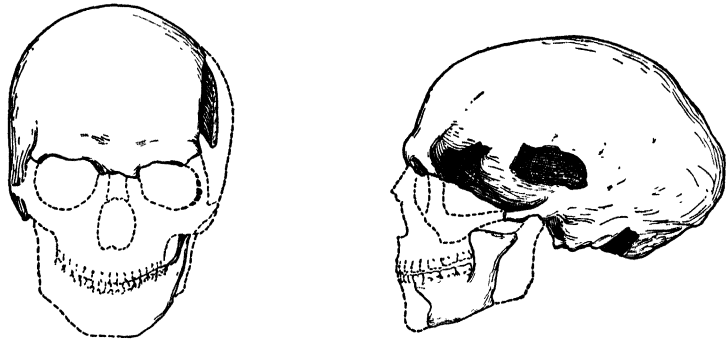


FIG. 4. GALLEY HILL. ACHEULEAN. (FACE RECONSTRUCTED.)

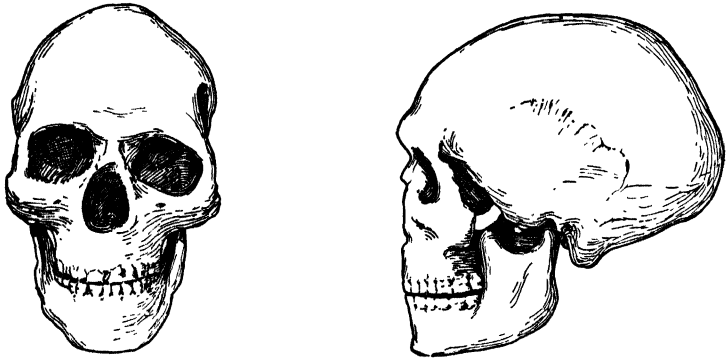


FIG. 5. COMBE CAPELLE. AURIGNACIAN.

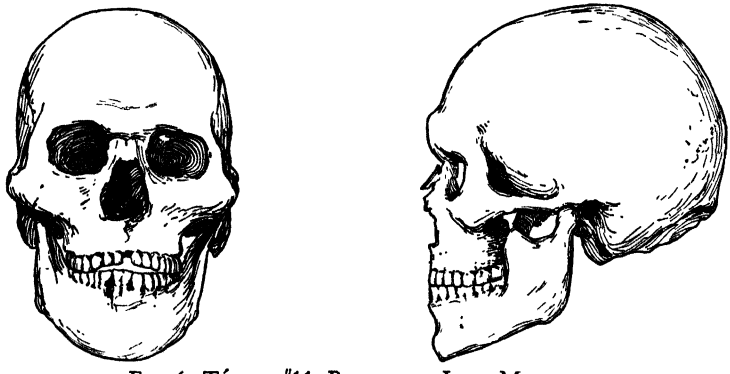


FIG. 6. TÉVIEC #11, BRITTANY. LATE MESOLITHIC.

Redrawn to scale: Fig. 4, from Keith, Sir A., *The Antiquity of Man*, Fig. 63, p. 188. Fig. 5, from Aichel, O., *Der deutsche Mensch*, Plate 2. Fig. 6, from Boule, M., and Vallois, H., **AIPH**, Mem. 18, 1937, Plate 14.

NEANDERTHAL AND NEANDERTHALOID DERIVATIVES

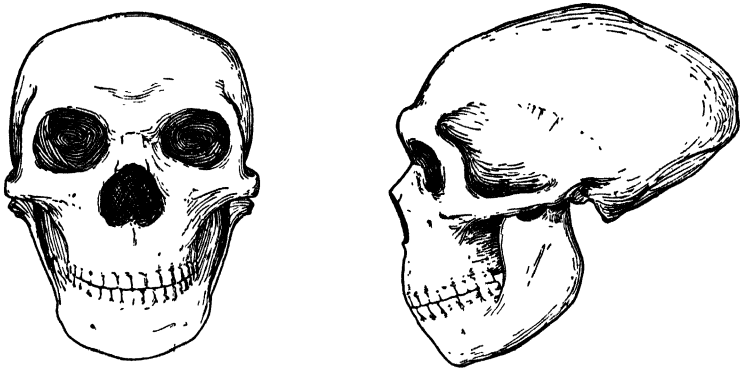


FIG. 7. NEANDERTHAL. LEVALLOISIO-MOUSTERIAN. (LA CHAPELLE AUX SAINTS, SLIGHTLY RESTORED.)

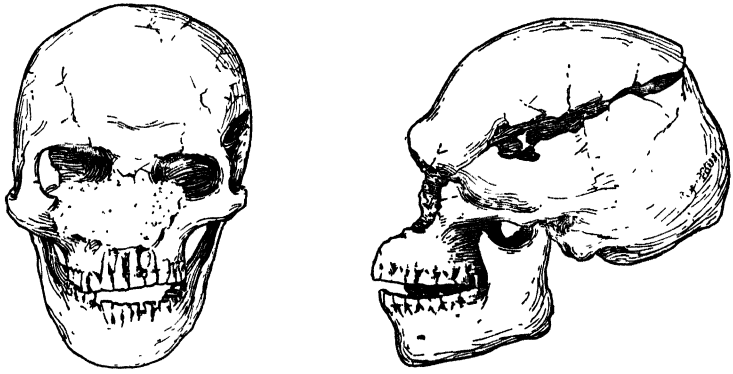


FIG. 8. SKHUL #5. PALESTINE. LEVALLOISIO-MOUSTERIAN.

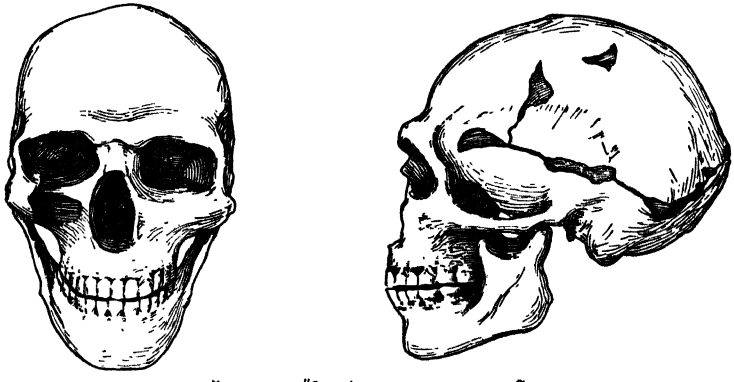


FIG. 9. PŘEDMOST #3. AURIGNACIAN OR SOLUTREAN.

Redrawn to scale: Fig. 7, from cast by J. H. McGregor, 1919. Fig. 8, from Keith, Sir A., and McCown, T. W., **BASP**, Bull. 13, 1937, Plates 5 and 6. Fig. 9, from Aichel, O., *Der deutsche Mensch*, Plate 4.

BROAD-HEADED CRANIA OF NEANDERTHALOID INSPIRATION

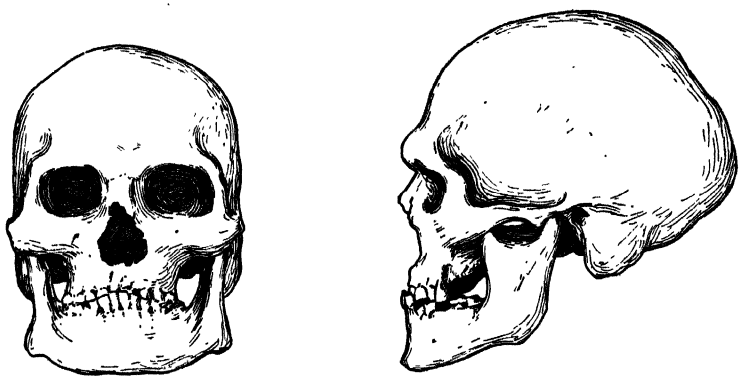


FIG. 10. AFALOU #12. AFALOU BOU RUMMEL, ALGERIA. EARLY ORANIAN.

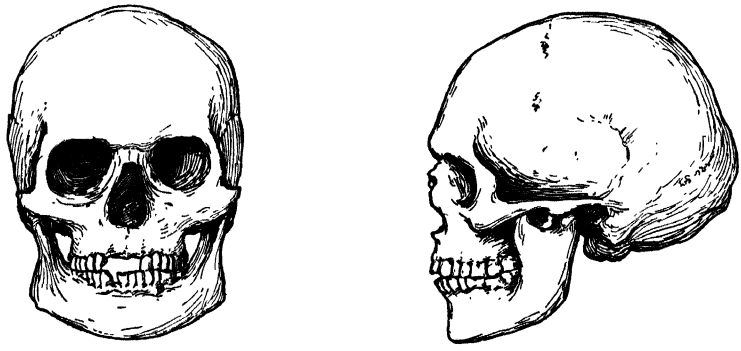


FIG. 11. HVELLINGE #1. SWEDEN MESOLITHIC.

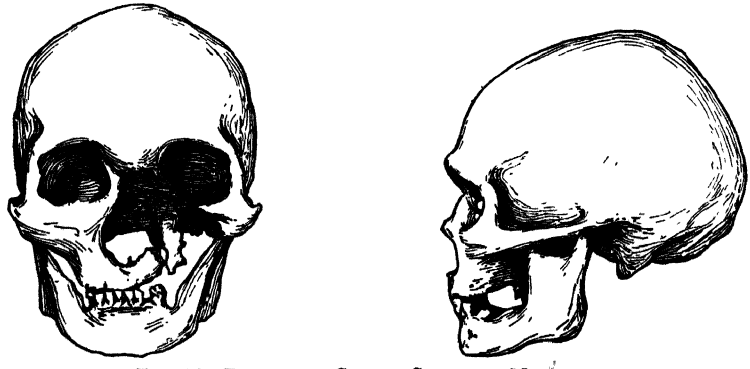


FIG. 12. FJELKINGE, SKANE, SWEDEN. NEOLITHIC.

Redrawn to scale: Fig. 10, from Boule, M., Vallois, H., and Verneau, R., **AIPH**, Mem. 13, 1934, Plate 13. Fig. 11, from Aichel, O., *Der deutsche Mensch*, Plate 17; also Kossinna, G., *Ursprung und Verbreitung der Indogermanen*, Fig. 134, p. 123. Fig. 12, from Retzius G., *Crania Suecica Antiqua*, Plates 39–40.

MESOLITHIC AND NEOLITHIC CRANIA OF MEDITERRANEAN TYPES

FIG. 13. MUGE, PORTUGAL. LATE MESOLITHIC OR EARLIEST NEOLITHIC.

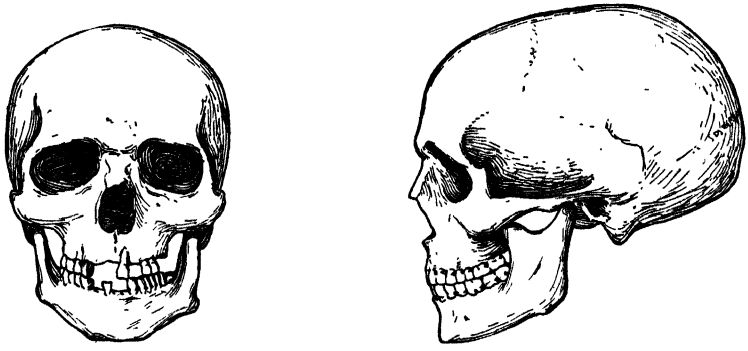


FIG. 14. LONG BARROW, BRITISH NEOLITHIC.

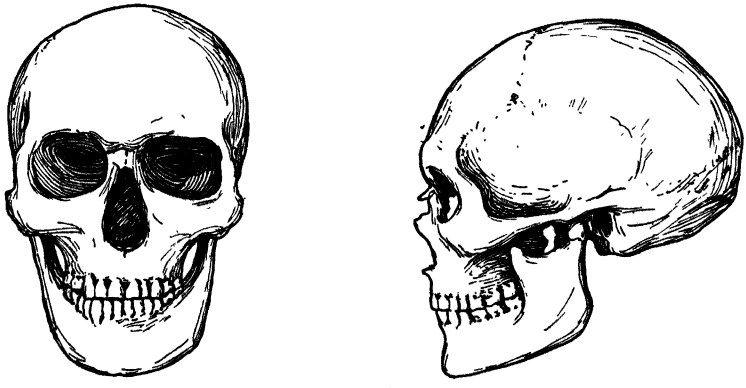


FIG. 15. CORDED FROM GOTLAND, NEOLITHIC.

Redrawn to scale: Fig. 13, from Vallois, H., **Anth,** vol. 40, 1930, Fig. 2, p. 344. Fig. 14, from *Crania Britannica,* vol. 2, Plate 59. Fig. 15, from Kossinna, G., *Ursprung und Verbreitung der Indogermanen,* Fig. 102, p. 90.

Chapter III

THE MESOLITHIC PERIOD

(1) THE HISTORICAL SETTING

The Mesolithic cultural period, which follows the final Palaeolithic in Europe, is wholly post-Pleistocene in that continent, and extends roughly from immediately post-glacial time to 3000 B.C. and later.

The Mesolithic manner of living was primarily similar to that of the Upper Palaeolithic. People still relied on hunting and the gathering of wild vegetable products for food, and the population must have remained as sparse as ever. Man had acquired but one domestic animal—the dog, which may have helped in hunting, but which was not bred for eating, and hence served as only an indirect source of food. The Mesolithic economy was, therefore, a prolongation of the Upper Palaeolithic system into relatively recent times; in the technical sense, however, there were certain improvements; with the introduction of microliths composite weapons were made; dugout canoes furnished good water transportation, and tree-felling axes must have made the building of adequate houses possible. The forerunners of the textile arts were probably developed to permit the manufacture and use of fish nets, good basketry, and matting.

The cultures of the Mesolithic period in Europe may be divided into two elements of different origins, which in many regions met and blended. One was the intrusive Tardenoisian with its advanced microlithic technique, which came in from the south across the straits of Gibraltar, and perhaps around the eastern end of the Mediterranean.[1] These migrations into Europe from the south were caused by climatic shifts incident upon the final glacial retreat. As the glacier moved northward to take up its last stand in the high Scandinavian land-mass, the erstwhile well-watered and temperate belts of North Africa and the Near East suffered a gradual desiccation. As the rain-belt moved northward, zones of temperate and sub-tropical climate shifted from Africa to southern and central Europe, and the climate of Europe became warmer in early post-glacial times than it is at present. The people who brought the elements of the Tardenoisian complex northward had been accustomed to hunting on open grasslands before their arrival in Europe, and they, therefore, settled in sandy regions

[1] Clarke mentions this second route as a possibility. Clarke, J. G. D., *The Mesolithic Settlement of Northern Europe*, pp. xiv–xv.

and treeless highlands, since neither their tool kit nor their general manner of living was suited to a forest environment.

The second cultural element was furnished by the survival of the old Upper Palaeolithic techniques, employed by the descendants of the reindeer hunters. The gradual growth of forest in what had formerly been the North European tundra belt forced them to learn a new kind of hunting and to live on the flesh of new animals, while the warming of northern waters gave them an abundance of fish and molluscs, focussing their attention not only on the forest but also on the rivers and sea.

In the north and west of Europe, where the glacier lasted the longest, cultures of Aurignacian and Magdalenian tradition survived into the full Mesolithic, when some of them blended in varying degrees with the newly arrived Tardenoisian. In outlying regions, such as the north coast of Ireland and Finnmark in Norway, flint implements of Upper Palaeolithic inspiration may still have been made as late as the time of Christ.

For the purpose of simplification, therefore, the history of the Mesolithic period in Europe may be reduced to two elements: (1) an invasion of microlith-makers from southern regions which had been temperate and desirable during the Late Pleistocene, but which were now drying up and becoming less habitable than Europe; (2) survival of the Palaeolithic people of Europe in various regions and in varying intensity, but concentrated especially in the northern forest belt, along the western coasts, and in the centers where the ice had lasted longest, notably, Norway and Switzerland.

(2) MESOLITHIC MAN IN AFRICA

Before gathering information which will help us in Europe, let us first see what changes or continuities occur in Africa, with the passage into post-Pleistocene time. In East Africa Leakey has found skeletons associated with a microlithic culture which he calls Elmenteitan, probably at least partly contemporary with the post-glacial Mesolithic cultures of Europe,[2] with which he has tentatively correlated it. The series includes the skulls of three adult males, three adult females, and one child, as well as a number of miscellaneous long bones. The bodies which they represent had been placed in rock niches on either side of a watercourse, and a subsequent flood had washed most of them out and deposited them in silt. Hence, it is impossible to associate the long bones with the crania.

From this series of seven skulls, it is evident that the earlier East African Mediterranean racial types were carried over into the post-glacial period with little or no alteration. The vaults of the Mesolithic skulls are again comparable in size to Galley Hill and Combe Capelle. The shape of these vaults, however, is now variable, at least in the female group, for

[2] Leakey, L. S. B., *Stone Age Races of Kenya*, Chapter 6.

one of the latter skulls has a cranial index of 80. This sex distinction in shape, may, of course, have been equally present in the Aurignacian group, but we have no material to confirm it.

The face continues the special evolution which had begun during the Aurignacian; it grows both longer and broader, while the nasal height increases at the same time.[3] Both the faces and noses of these skulls are exceptionally long, by any racial standards. All of them have high orbits. The nose remains leptorrhine, but the nasal skeleton is not highly arched; some of the crania, especially one of the female specimens, show considerable prognathism. In general, the foreheads are sloping, the browridges and other bony markings slight to medium on the males, while on the females the browridges are actually lacking. One male specimen, Elmenteita A, differs from the others; the mandible has everted gonial angles while on the cranium the temporal crests rise high over the parietals, producing a narrow forehead, and giving the whole head a pseudo-Eskimoid appearance.

In the Gamble's Cave Aurignacian series, since only males were represented, it was impossible to tell whether or not any extensive differences between the sexes existed. In the Elmenteitan group, the male crania exceed the female ones considerably in the length and breadth of the vault and in the face heights and face breadth. Vault heights, forehead breadths, and orbital dimensions are much the same in both, however. These East Africans, therefore, while lacking the bony luxuriance of the Upper Palaeolithic Europeans and North Africans, do exhibit a positive amount of sex linkage in the characters which make them racially distinctive.

Despite the continued residence of this long-faced racial group in East Africa, there is still little that is negroid about most of the skulls. The forehead, in some of the females, is a bit bulbous, but so it is with many living Mediterraneans; some of the jaws project forward with a considerable alveolar prognathism, but so do the jaws of a number of early European crania.[4] The nasal index, which falls near the human minimum, is at the opposite extreme from those of negroes. The nasal bones, present in but two crania, are long, narrow, and hour-glass shaped; they taper upwards, and penetrate high into the frontal bone, as with certain anthropoid apes and the Eskimo; but the two bones are not greatly arched and the nasal vault, in these two specimens, is low. Thus the nasal bones possess an individual character which is neither typically white nor negroid.

The Elmenteitan people remained as tall as the Upper Aurignacians.

[3] Nasion-menton heights on males are 126 and 132 mm.; nasion-alveon 80 and 81 mm.; nose heights 58 to 59 mm.

[4] The female skull #F 1 is the most nearly negroid of all, and in this case a definite negro strain seems very likely.

The mean stature for six males is 178.7 cm., for three females, 152.5 cm.; thus, the sex differences are great in bodily size, as well as in head and face diameters. The greater stature and sex differentiation of these East Africans may have been simply the result of evolutionary change; one cannot find a non-*sapiens* species to provide these modifications, as in the case of the Upper Palaeolithic Europeans.

Before we leave East Africa for some time, it may be interesting for us to note that Leakey has also found a number of skeletons associated with a parallel culture, Wilton A., located nearby and probably not later than Elmenteita. These Wiltonians were tall, heavy-boned men, with large, strongly arched foreheads, and small faces, very much like the Strandloopers from South African shell heaps, and ancestral Bushmen. Thus along the Lake Victoria shore line, not far away from Elmenteita, were ancestral Bushmen, living in geographical proximity to Mesolithic ancestral Hamites. The East African whites lived on a racial frontier, and not in a center of white racial differentiation. If Bushmen traits turn up now and then among Hamites or Hamitic traits among Hottentots or Bushmen, there is little wonder.

North Africa was occupied, during the post-glacial Mesolithic period, by the Middle Capsian successors of the Afalou people. These are known through a collection of skulls from the site of Mechta el 'Arbi, of which only nine have been studied in any detail.[5] All come from what Arambourg calls the Middle Capsian, which has been correlated chronologically with the European Solutrean by Menghin, with the Solutreo-Magdalenian by Obermaier, and with the Mesolithic by Vaufrey.[6] They are considered here rather than in the preceding chapter since they belong with the Mesolithic in the European sense both racially and culturally, whatever their chronological position.

It is impossible, unfortunately, to treat these skulls with complete clarity. Judging by published measurements, photographs, and drawings, we may conclude that on the whole they resemble the earlier Afalou skulls in a general way, but that most of them are smaller and lack the ruggedness of their predecessors, having weaker browridges, less pronounced muscular markings, and narrower faces. Some of them have vertical foreheads, a feature foreign to the Afalou people. They still retain in most instances, however, a low face and low orbits, and a range of head form reaching the limits of the earlier series.

[5] Probably over fifty crania have been removed from this site by successive expeditions, but only five have been carefully studied. See Cole, Fay Cooper, **LMB**, vol. 1, 1928, pp. 167–189. Four others, of which two only are from the Mechta site, have been dealt with, as thoroughly as the data permitted, in the Afalou volume.

[6] Vaufrey denies the existence of a Middle Capsian, and says that these skulls are Late Capsian, which he considers Mesolithic.

In their degree of size reduction, and diminution of sex-linked bony profusion, they may be likened to some of the Mesolithic crania from Europe, which will be studied later in this chapter. It is quite likely, as Cole suggests, that one of the Mechta skulls showed a negroid tendency, while the others were subjected to mixture with Mediterranean racial elements. The inference is that the countries at the eastern end of the Mediterranean, from which these influences probably seeped, were already inhabited by small Mediterraneans. On archaeological grounds, it is unlikely that these Mediterranean racial elements came directly from the Sahara.

Our entire knowledge of the racial composition of the early inhabitants of the southern Sahara is furnished by a single skeleton, unearthed at Asselar, a military post some four hundred kilometers north of Timbuctu, in what is now utter desert,[7] but what was at the time a fertile, well-watered plateau, drained by wide rivers, and rich in grass and ruminant game.

The skeleton, which had not been buried but which simply lay in the place of death, was covered by lake-laid sands. These same sands have yielded the bones of huge fish, in the same state of fossilization as those of the man, and the shells of fresh-water molluscs, which indicate that the region of Asselar was at that time still a lake country, with running streams and a forest border, near the southern limit of the south-Saharan grasslands, and the northernmost extension of the tropical forest. Asselar man died before this region had become desiccated, but his cultural association is Mesolithic or Early Neolithic, and his chronological age unquestionably post-glacial.

He was a tall man, over 170 cm. in height; his limbs were long in proportion to his trunk, and his forearms and lower legs long when compared to the proximal segments of their extremities. His hands were long and slim, with small carpal bones, unlike the broad hands and thick wrists of the Afalou men farther north.

The skull is of medium vault size, comparable to Grimaldi, Afalou #28, and the Kenya Aurignacians. Like all of these, it is dolichocephalic, with a cranial index of 71. The muscular markings of the vault are slight, and the browridges weak. In facial dimensions, Asselar is intermediate between the Grimaldi and East African extremes. Morphologically, however, it is the most negroid specimen of equal age yet found. The malars project forwards, and the lower border of the orbit stands in front of the upper, when the skull is placed in the eye-ear plane. The nose is chamaerrhine, and negroid in conformation.

Asselar man was either an incompletely evolved negroid, or a negro-

[7] Boule, M., and Vallois, H. V., **AIPH**, Mem. 9, 1932.
See also Bailly, René, **RA**, vol. 43, 1933, pp. 172–181.

white hybrid; he did not closely anticipate, in cranial form, the modern blacks from the Guinea Coast and Sudan. He retained certain tendencies in a white direction, and others which related him to the Bushmen and Hottentots. The Asselar find, like those in East Africa, makes it very likely that the spread of fully differentiated negroes into much of their present area in Africa was a fairly recent phenomenon.

(3) THE NATUFIANS OF PALESTINE

Compared with the continent of Africa, from the prehistoric standpoint, Asia is archaeologically little known. So far, excavations have revealed implements of Mesolithic technique in Kurdistan and in Palestine,[8] but only from the latter have Mesolithic skeletons been recovered. Here an Aurignacian culture lasted during the entire Late Pleistocene, and directly preceded the Mesolithic. Since Miss Garrod feels that this region was one of the main areas of differentiation of the Aurignacian cultural technique, it is very unfortunate that not a single Aurignacian skull has been published. Therefore, the very important question of the Late Pleistocene relationships of this key area must remain unsettled.

For the following period, however, at least two hundred skeletons have been exhumed from two different Mesolithic levels and from five or more sites. So far, only two of these skeletons have been published, one from each level. Great doubt is current at the moment concerning the exact nature of the physical types of this people, and we must await detailed publications in the near future before this matter may be settled.[9]

These Palestinians, who have been given the name Natufians, apparently differed in physical type from period to period. One of the two skeletons which has been published is that of an adult female from the earliest level at a site called Erg el Ahmar.[10]

The skull of this woman is large, robust, and thick-walled; it is purely dolichocephalic, and has an elevated cranial vault in which the height almost equals the breadth. The forehead, as with females of many races, is broad, straight, and rounded. The face, likewise, is broad, and of medium height; the nasal root, somewhat depressed, is hidden under browridges massive for a female, while the nasal bones project far forward, to form an accentuated profile.

The low, broad orbits of this specimen assume the rectangular form characteristic among most of the Upper Palaeolithic skulls from Europe and North Africa, while the orbital index is correspondingly low. The

[8] Garrod, Miss D. A. E., **BASP**, No. 6, 1930, pp. 8–43.

[9] Mr. T. D. McCown was, at the time of writing, engaged in working over a large collection of these skeletons under the direction of Sir Arthur Keith and intends to publish it shortly.

[10] Vallois, Henri, V., **Anth**, vol. 46, 1936, pp. 529–543.

nose is high, narrow, and metrically leptorrhine; the nasal spine prominent, and the lower border of the piriform opening strongly crested. The mandible, of medium robusticity, possesses a prominent chin. The rugged beauty of this Natufian woman was, however, somewhat diminished by an abnormality of dental occlusion, for her lower incisors overlap the upper ones.

Morphologically, this skull is perfectly European and belongs without question to the general Upper Palaeolithic type. It would also fit metrically into the female range for this group. It would, however, fit equally well into the North African series of Afalou bou Rummel, except that it is somewhat narrower nosed than the females of that group as known at present.[11] In the absence of data on Palestinian Aurignacian crania, one may suppose that the Aurignacian Upper Palaeolithic Neanderthal-*sapiens* hybrid developed in this neighborhood from Skhul-like beginnings, and that this Erg el Ahmar female is a survival of it.

The skulls from the later Natufian period, while exceedingly numerous, remain dubiously classified because of several conflicting ideas about them which have been published. Sir Arthur Keith [12] in a preliminary report on the remains from Shuqbah and Kebara, states that the later Natufians were short people, the males having a mean stature of 160 cm. and the females of 152 cm. The tallest male in the group was only 165 cm. in height. The hands and feet of these later Natufians were remarkably small, and their long bones were in no sense massive.

The skulls which Keith describes are of a peculiarly Mediterranean type, with a cephalic index ranging from 72 to 78, thus rivalling the subdolichocephalic head form of short statured Mediterraneans living today. The brain cases are of medium size, and the faces absolutely small. The lower jaws are also small and weakly developed, with little chin prominence and a prevalence of alveolar prognathism. The wide, low-vaulted nose, in combination with prognathism, gives a somewhat negroid cast to the face. The browridges are smooth, and the whole system of muscularity in the male but slightly developed. These late Natufians represent a basically Mediterranean type with minor negroid affinities.[13] There was, apparently, a change of race during the Natufian. These small Mediterraneans must have brought their microliths from some point farther south or east, impelled by changes of climate.

[11] Some of the Mugharet el Wad crania, which belong to the earlier horizon, seem likewise to resemble those of the Upper Pleistocene. This comparison represents, however, a preliminary impression, and is stated only with reservations. Personal communication by Mr. T. D. McCown.

[12] Keith, Sir A., *New Discoveries*, pp. 202–214; **PICP**, 1932, pp. 46–47.

[13] This impression is also confirmed by the French school.
Boule, Vallois, and Verneau, *Les Grottes Palaeolithiques de Beni Séghoual*, pp. 212–214.

(4) THE MIDDEN-DWELLERS OF THE TAGUS

Although, during the last century, many skulls have been removed from caves in various parts of Spain, not one of them may be assigned with complete security to the Mesolithic period. Since Spain was apparently the main if not the only highroad of migration northward from Africa into Europe during the Mesolithic, this gap in our knowledge is extremely unfortunate, particularly in view of the parallel deficiency in Morocco.

Late Mesolithic skeletons have, however, been found in Portugal, in a series of shell-heaps which lie on a raised shore near the village of Muge, on the eastern bank of the Tagus River, some fifteen miles upstream from the head of tide-water. At the time of occupation, the shellfish which the midden-builders ate lived in salt water,[14] and the land must have lain several meters lower than its present level. This sinking may probably be correlated with the formation of the Litorina Sea, which lasted in what is now the Baltic from 5600 to 2500 B.C. If this dating applies to Portugal, the Muge middens were probably formed nearer the end of this period than its beginning. The safest dating for this site is immediately pre-Neolithic,[15] if not early Neolithic, in the third millennium B.C.

Over two hundred human skeletons have been removed from these middens at various times during the last eighty years. Of this number, however, only nine have been measured and published in such a way that we may profitably consider them here.[16] In the past, many curious ideas have been circulated about the racial types represented by these remains, and these notions have been widely credited and frequently repeated. The principal misconception has been that the Muge crania include two types: a non-European negroid, and a hyperbrachycephal variously called Alpine and mongoloid.

Actually, there is no evidence to show among them a greater negroid tendency than is commonly found among many living Europeans of Mediterranean extraction, while the so-called "brachycephalic" skulls are probably all or almost all mesocephalic, since some were badly warped

[14] Obermaier, H., *Fossil Man in Spain*, p. 325.

[15] Obermaier, *op. cit.*, p. 325, says: "The fauna of these deposits does not include any domestic animals—except perhaps the dog—and consists of wild cattle, deer, *sheep or goat*, horse, swine, dog or wolf, felines, badger, civet, and hare." (Italics are mine.) The Iberian Peninsula is not known, at the period in question, to have sheltered either wild sheep or wild goats. The only animal which could possibly have been mistaken for either is a diminutive ibex, the bones of which are much smaller than those of either sheep or goat. Unless the bones in question are actually those of ibex, the Muge midden-dwellers must have already met the first waves of the Neolithic economy from North Africa. Agriculture and domestic animals did not necessarily enter the Iberian Peninsula in one magnificent sweep; scattered families of herdsmen may have wandered over as an advance guard.

[16] Vallois, Henri V., **Anth,** vol. 40, 1930, pp. 337–389.

by earth pressure, and others were improperly measured; while still others have been lost or mislaid.[17]

The cranial series from Muge, as it is known at present, is reasonably homogeneous. The cranial index ranges from 69 to 80, or possibly 82, with most of the skulls in the low seventies. One may postulate a mean of about 75 to 77 on the living. The brain case is of medium size, but relatively high; ovoid in form, flattish on the top, and gently rounded in the occipital region. The female crania have vertical foreheads, while those of the males are sloping; the frontal bone in both is always strongly curved. On most of the male skulls, the browridges are well developed in the median segment, but not on the sides, while on the female specimens, the supraorbital region is usually quite smooth.

The orbits are low, but not especially narrow. The nasal dimensions are small, yielding a mesorrhine index; the lower border of the nasal opening is usually sharp, but in some cases it is rounded, and in one guttered. The face is mesoprosopic, being both low and extremely narrow. In the photographs, the zygomatic arches appear to be delicate, and closely aligned to the temporals. The mandibles are of moderate height, but narrow, while the palates are quite large for the total size of the skulls, and the teeth are also large. Most of the skulls show a slight alveolar prognathism, which in a few instances is quite marked.

Among the nine crania measured by Vallois, the females equal the males, or approach them closely, in all dimensions. Sex differentiation, therefore, is practically absent from the metrical standpoint, but the difference in browridge development is apparently sufficient to permit the craniologist to distinguish them readily. The long bones, studied apart from the crania, to which they cannot be matched, give a reconstructed stature of 160 cm. for the males, and 152 cm. for females. Despite this short stature, a limb form found among some Upper Palaeolithic peoples is repeated here—the distal segments are long when compared to the proximal.

The racial position of the Muge population cannot be finally determined until more evidence, both internal and comparative, is at hand. Yet from present indications there seems every reason to believe that the Portuguese midden-dwellers were very similar to, or identical with, the late Natufians of Palestine, and that both represented a northward thrust from a Mediterranean racial homeland somewhere in southwestern Asia, northeastern Africa, or both.

(5) MESOLITHIC MAN IN FRANCE

Our knowledge of Mesolithic man in France is little better than that of the Iberian Peninsula, despite the extensive digging which has been

[17] Vallois, *op. cit.*

going on there for almost a century. French Mesolithic sites are divided into two main cultural groups, the Azilian and the Tardenoisian. The Tardenoisian represents the northward advance of the Capsians from North Africa, and its eastward spread across central Europe to Russia, and perhaps beyond. The Azilian represents a degenerate Magdalenian cultural expression surviving in southwestern France, in the Asturias of Spain, and in parts of England, under incoming Tardenoisian influence. By the time of the full Mesolithic, the fauna of France had changed almost completely, for the reindeer which the Magdalenian people had hunted had been replaced by red deer, while the impressive mammoths and other large mammals were by now long extinct.

The only French Mesolithic series known, aside from single skeletons, comes from Téviec, a small island to the west of the peninsula of Quiberon, Morbihan, Brittany.[18] Here a coastal population subsisted on molluscs, including Litorina, and crustaceans, with little hunting. Its remains, consisting of twenty-one skeletons, come from stone cists buried in a midden on a raised beach. The implements, as shown in the archaeological part of the Téviec report, seem to be of a marginal, Azilian-like Epipalaeolithic character, like those from the Asturian horizon in Spain, with some late Tardenoisian influence. On the basis of the artefacts, the raised beach, the Litorina skulls, and the stone cists, one must suppose that the remains cannot be older than the fourth millennium B.C., and may be even later. However, they are purely Mesolithic and antedate the local Neolithic, however retarded.

Of the twenty-one skeletons, seven adult males and eight adult females have been studied (see Appendix I, col. 3). The skulls are reasonably uniform; they are smaller in size than the Upper Palaeolithic French crania, but a little larger than those of the Muge people or Natufians; the vault is as high as its breadth; the cranial form between dolicho- and mesocephaly, with a male mean of 74.3, and the narrow range of 72 to 77. These skulls are thick boned, and rather massive in structure. Morphologically, they resemble the Upper Palaeolithic rather than the Mediterranean form. The faces are low and relatively broad, with the bizygomatic diameter often exceeding the head breadth. The browridges of some of the males are rather heavy, the nasion depression deep. The noses are mesorrhine, and fully European in form; the orbits are low.

On the whole, these skulls look like smaller replicas of Aurignacian and Magdalenian forms, or an intermediate stage between these and the Mediterraneans from farther south, as exemplified by the Portuguese and

[18] Péquart, Marthe, and St. Juste; also, Boule, M., and Vallois, H., **AIPH**, Mem. 18, 1937.

Palestinian specimens. One skull in particular bears a striking resemblance to Chancelade.

The statures of these people were low: 159 cm. for the men, 151 cm. for the women; the long bones not very heavy. The distal extremities were relatively long; not as much so as in some earlier skeletons, but more so than among most living Europeans.

Our interpretation of these late Mesolithic remains from the western corner of France is that they represent a group of marginal Epipalaeolithic survivors from beyond the Pyrenees, pushed northward, partly by climatic changes and partly by the arrival of new people from North Africa. We have, after all, no other evidence to show us what kind of people inhabited the Iberian Peninsula during the Late Pleistocene; a conglomerate of first wave Grimaldi-Combe Capelle-like Aurignacians plus some Magdalenians, plus some bringers of microliths from the south and east, would presumably look very much like this Téviec type, especially since the overgrown Middle and Late Aurignacians did not hunt south of the Pyrenees.

Aside from this Téviec series, the Azilian culture proper is represented by the remains of four individuals removed from the Trou Violet at Montardit,[19] Arriège, in the northern Pyrenees, near the type station of the Azilian at Mas d'Azil, and one mandible and several long bones, from Mas d'Azil itself.[20] Only one specimen, the so-called Montardit I, includes a complete skeleton, or even a complete brain case. Without elaboration, one may say that in every respect they belong to the same type as that of Téviec.

(6) THE OFNET HEAD BURIALS

The third reasonably large series of Mesolithic crania in Europe comes from the Ofnet cave near Hohlheim in Bavaria,[21] where thirty-three skulls were found neatly arranged in a solid circle, like eggs in a nest. Nineteen of them belonged to children, ten to women, and only four to men. Along with the skulls were, in most cases, the two topmost neck vertebrae, the axis and atlas. The bodies were missing. A few miles away, at Kaufertsberg, a single adult male skull has been discovered which was buried under identical circumstances.

Unfortunately, it is impossible to detect the murderers in this Mesolithic mystery. The peculiar sex ratio, the fact that all the heads were buried at once and while still fresh, and the further fact that all had been fractured by sharp blows with a lens-shaped implement similar in form to a round-poled celt,[22] make it unlikely that this was a normal, peaceful form of

[19] Sawtelle, R. O. (Mrs. Wallis), **PMP**, vol. 11, #4, 1931.
[20] Piette, E., **BSAP**, ser. 4, vol. 6, 1895, pp. 485–486.
[21] Scheidt, W., *Die eiszeitlichen Schädelfunde aus der grossen Ofnet-höhle, etc.*
[22] Mollison, T., **AAnz**, vol. 13, 1936, pp. 79–88.

burial. The skulls were daubed with red ochre, and a few flint implements were left with them. From these clues we may deduce that the killers, their victims, or both, were culturally either Tardenoisians,[23] or Azilians, and that the date is probably Period II of the Mesolithic.[24] These skulls do not form a homogeneous group, but differ greatly in head form, as well as in other characters. Of the two dolichocephals, the male #K1818 is obviously an Upper Palaeolithic survivor, without visible change. This skull exceeds the rest of the series in general size. It is extremely massive, with projecting browridges, a retreating forehead, a very broad face, extremely low orbits, and a ponderous mandible. Its cubic capacity is well over 1600 cc. Its companion, a male of lesser dimensions, is less extremely developed and falls closer to the general type of the series.

The mesocephals, which include Kaufertsberg, are smaller, and relatively higher vaulted; as Boule and Vallois have pointed out,[25] they verge on the type of Téviec, which these authors consider to be Magdalenian survivals. At any rate, they do not seem to be intermediate between the dolichocephals just described, which resemble rather a full Aurignacian prototype, and the brachycephals.

The last present the real Ofnet problem. Two of the brachycephalic crania are masculine,[26] two feminine, with the highest index, that of a female, 87. These skulls are long, wide, and of moderate vault height; the faces are without exception wide. In one of the male specimens (K1809) the greatest length of the skull lies in the forward segment, as with modern planoccipitals, such as Armenoids. The forehead of this skull is very wide, and the face extremely broad and low. The face is, furthermore, completely orthognathous, and the lower jaw is very massive, with flaring gonial angles and a square, bilateral chin. This jaw is also very high, and reduces the impression of shortness in the total facial plane. The other male specimen, on the borderline of brachycephaly (K1800) is the only one in the whole group which is hypsiconch, and one of two that are leptorrhine.

The female skulls show a considerable sex difference in head form, and likewise in browridges and other manifestations of bony relief. As with their Upper Palaeolithic prototypes, they are notably smaller, in most cases, than the males. On the whole, they vary much less than do the masculine crania, and fall closest to the brachycephalic male, K1809, in type.

[23] Clark, J. G. D., *The Mesolithic Settlement of Northern Europe*, p. 218.

[24] Mollison, in view of the cross-section of the implement with which they were killed, suggests that the date may have been Late Magdalenian, since no such implement reappears until the Late Neolithic. Mollison, T., *op. cit.*

[25] Boule, M., and Vallois, H., **AIPH**, Mem. 18, pp. 170–177.

[26] Including #K1800, the C. I. of which is 79.85.

Despite the differences between these skulls, which have been emphasized in the foregoing description, they all have in common an Upper Palaeolithic character. The dolichocephalic males might have been direct descendants of the local Late Pleistocene population or intruders of similar type from North Africa. The mesocephals might have been, and probably were, the bearers of the Azilian culture from southern France to Bavaria. The brachycephals, on the other hand, may have been survivors of the type represented by Solutré #2 several thousand years earlier, but their resemblance to the brachycephals of Afalou bou Rummel is much stronger.

It is possible that the old Afalou type was thrust into central Europe at the head of the wave of migration which brought the smaller Mediterraneans to Portugal. It is likewise possible, but on archaeological grounds still impossible to demonstrate, that these brachycephals came from Asia Minor or Palestine, where an Afalou-like type existed in the early Natufian, and presumably still earlier. The question of the origin of these brachycephals cannot be settled without further data.[27] At any rate, the skulls of the Ofnet victims serve to show that various survivors of an older order had begun to assemble north of the Alps in early post-glacial times.

(7) MESOLITHIC MAN IN THE CRIMEA

From Ofnet eastward, Mesolithic Europe is a blank until we reach the Crimea, for in all the intervening territory, no human remains of this period have been found and described. In the small cave of Murzak Koba,[28] near the Crimean village of Chorgun, Soviet archaeologists have found two skeletons crushed under heavy stones which fell from the roof. One is masculine, the other feminine.

The man from Murzak Koba was tall (180 cm.); long headed, large headed, with heavy browridges, and heavy superior oblique ridges on the occiput. The configuration of the nasion region, with a depressed root, is typical of Upper Palaeolithic European man; while the orbits are extremely low and wide. The face is wider than the Upper Palaeolithic mean, and longer. Murzak Koba man was, without any question, a survival of the eastern European Upper Palaeolithic type into Mesolithic times. His female companion apparently represented the feminine version of the same race.

[27] The photographs of at least three out of eight Ofnet crania, published by Scheidt, show apparent signs of tooth knocking. These are K1809, upper right lateral incisor; K1813, lower right median incisor; Kaufertsberg, lower left lateral incisor. Since incisor evulsion was found in some of the Natufian skulls, as well as in the one published Late Capsian cranium, this might indicate either a southeastern or a southwestern connection. (Personal communication of T. D. McCown, for Natufians. The Late Capsian skull is Aïn Mlila, described by Boule, Vallois, and Verneau in the Afalou monograph.)

[28] Field, Henry, **AA**, vol. 39, 1937, p. 468.

The cultural equipment of this couple consisted of flint implements and bone harpoons of Mesolithic type. The bearing of these two skeletons on the general problem of Mesolithic diffusion is that an entry of Mesolithic culture and race into Europe from a point this far east is rendered a little less likely.

This does not, of course, affect in any way the possibility of an entrance by way of the Balkans; but extensive reconnaissance work in Jugoslavia has failed to locate any Mesolithic horizon there.[29] We are again forced to the conclusion that the bulk of the Mesolithic influences, both cultural and physical, which entered Europe after the retreat of the glacier came into that continent over the Straits of Gibraltar,[30] a conclusion which may, of course, need revision as new evidence shall come to light.[31]

(8) PALAEOLITHIC SURVIVALS IN THE NORTHWEST

During the maximum of the Würm II glaciation, Palaeolithic man adapted himself, as we have seen, to the cold. Once so adapted it is only natural to suppose that he followed the climate to which he was accustomed northward as the ice melted, and as the animals which he ate moved in the same direction. Now the final glaciation of Europe was centered not in the most northerly point of the continent, but in the land mass of the Scandinavian Peninsula, and, apparently, the coasts of Norway (northern and western) were not affected by the last glacial advance. Human beings thus could penetrate Scandinavia in Late Palaeolithic times.[32] Scandinavia, therefore, formed the last retreat of Old Stone Age man fleeing before the encroaching temperate conditions with their growth of forest and change of fauna; for when the ice disappeared he had no further place to go. Here at last the changing climate of the early post-glacial period faced him with the final necessity of modifying his culture.

The accompanying chart renders it unnecessary to describe at length the changes which took place in the Baltic region during the Mesolithic.[33] In Period I, which lasted from the end of Palaeolithic times until about 6800 B.C., following the de Geer chronology, a number of local industries

[29] Fewkes, V. J., **BASP**, #9, 1933, pp. 17–32.

[30] Italy must be rejected as a likely avenue of entry, since the culture of that peninsula during the entire Upper Palaeolithic was the Grimaldian, a local form of Aurignacian, which persisted, without a Solutrean or Magdalenian interlude, until Mesolithic times, and even through them to the Neolithic, with only a minor microlithic influence. Greenlee, R. F., *The Association and Interrelation of the Microlithic Cultures of Europe and Africa* (privately printed), 1935, pp. 28–31.

[31] Bonch-Osmolovskii, G., reports the discovery of another Mesolithic skeleton from the Crimea, buried in a crouching position. He states that it is earlier than Murzak Koba and is not of "Crô-Magnon" type. Quoted by Field, H., **AA**, vol. 39, 1937, p. 467.

[32] Boë, J., and Nummedal, A., *Le Finnmarkien.*

[33] Most of the following is based on Clarke, J. G. D., *The Mesolithic Settlement of Northern Europe;* also, **Antiquity**, vol. 12, 1938, pp. 154–171.

developed in northern Europe from Palaeolithic origins. Thus the tanged-point cultures which stretched from Belgium to the Ukraine, across the north of Germany and of Poland, are derived ultimately from Aurignacian

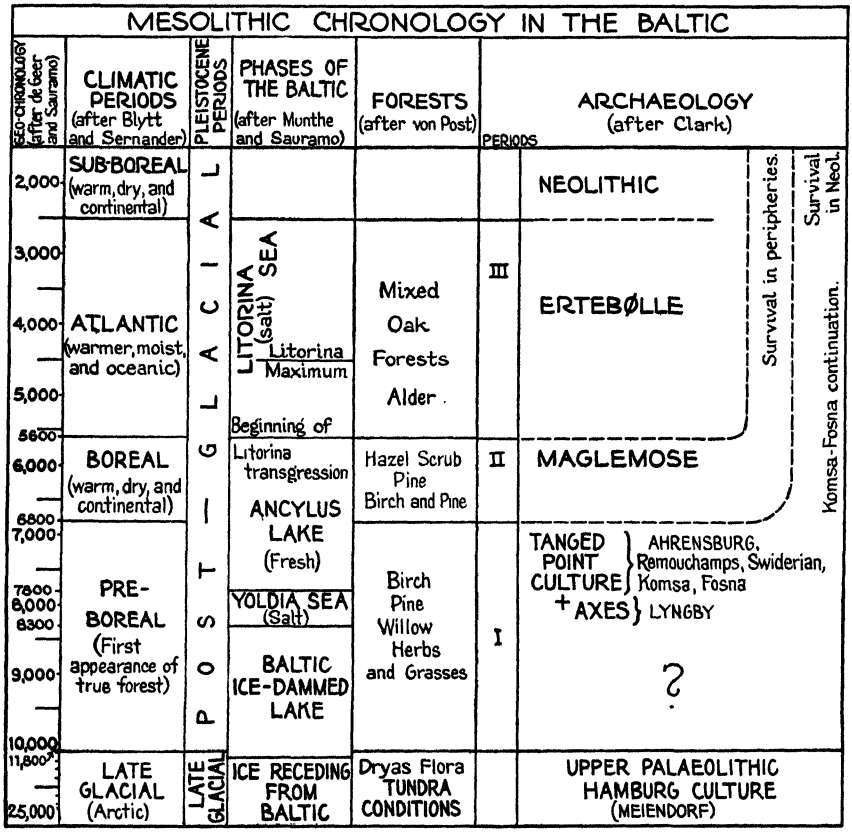


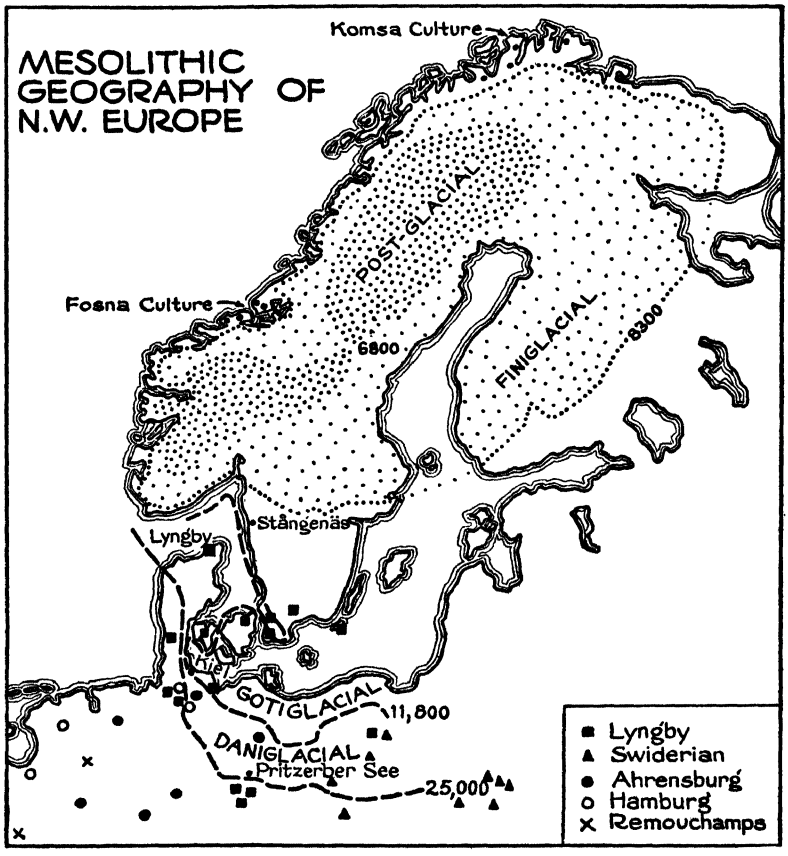
FIG. 16

Adapted and combined from the charts of Godwin and Clark, with further modifications suggested by Movius. Godwin, H., "Pollenanalysis," etc., *The New Phytologist*, Vol. 33, #4, Oct. 12, 1934, p. 339. Clark, J. G. D., *The Mesolithic Age in Northern Europe*, p. 53.

prototypes, and the Hamburg culture of Meiendorf, which was ancestral to the Ahrensburg of Period I, was partly contemporaneous with the French Magdalenian.

In the very north of Scandinavia, during at least the latter part of Period I, tanged-point using people lived beyond the upper edge of the glacier, isolated, on a narrow coastal fringe, from the rest of mankind. To the south of the ice, in Denmark and the southern end of Sweden, as

well as in northern Germany, Palaeolithic survivors apparently invented the so-called "Lyngby" antler axe to cope with the encroaching forest. However, the most important culture of this period was the Ahrensburg,



MAP 1

After Clark, J. G. D., *The Mesolithic Settlement of Northwestern Europe*, 1936, Fig. 15, p. 55; **Antiquity**, vol. 12, 1938, Fig. 2, p. 158.

which is best known from recent excavations at Stellmoor, a few miles northeast of Hamburg.

In Boreal times, Period II (ca. 6800–5600 B.C.) the bed of the North Sea rose, and England and Scotland were joined to Denmark by dry land. At the same time the Baltic became a fresh-water lake, called the Ancylus. The entire North European plain, from England over to the Urals, was covered with a temperate forest. In this forest arose the Maglemose culture, which was derived from three elements: (1) the previous cultures of

the north, especially the Ahrensburg and the "Lyngby axe" cultures, (2) the Magdalenian, already incorporated in the Ahrensburg, (3) the northward moving Tardenoisian, of eventual southern and southeastern inspiration. Hence, the inhabitants of northern Europe in Period I (ca. 11,800–6800 B.C.) were simply the descendants of the people who had lived immediately south of the ice-sheet for several thousand years, while during Period II (6800–5600 B.C.) they were joined by the vanguard of newcomers, whom we may already have met at Ofnet. These facts should give us some idea of the physical composition of the North European population during these two periods.

The culture of Period III, which roughly coincides with the time of the Atlantic climatic phase, was conditioned by further changes of environment. The waters of the ocean rose due to the melting of the ice, the Baltic again became salt, and Britain was isolated from the continent by the encroachment of the North Sea. During Period III, the Maglemose manner of living persisted in the North European peripheries, while in the special center of Denmark and southern Sweden developed a new culture, the Ertebølle.

The Ertebølle people were gatherers and eaters of molluscs on the shores of the newly formed Litorina Sea, and at the same time salt-water fishermen. Their kitchen-middens, or shell-heaps, contain quantities of animal bones and discarded artefacts, including a crude pottery ware.

The Ertebølle culture had its roots in the Maglemose, although undoubtedly it was reinforced by new elements presumably from the south and east, and it was a local development from local human material. When the Neolithic farmers and herders finally reached Denmark and southern Sweden, they found a sedentary population of clam-diggers and fishermen firmly established along the coast, and owing to the abundance of sea food, this population must have been one of considerable density. Well-equipped sea fishermen on the shores of richly stocked waters offer far more resistance to invading agriculturalists than do hunters. The Ertebølle people were not driven out by their Neolithic neighbors, nor were they absorbed without trace into a larger population. In southern Scandinavia the old racial elements persisted alongside and in combination with the new, while in Norway the old tanged point makers lived on, to contribute technical methods to the Neolithic craftsmen.

Period I is not represented by a single piece of human bone which can be dated with any pretense of accuracy. Period II, the Maglemose, is known from a number of skeletal finds, most of which, however, are in doubt. The only remains which are completely accepted and about which there can be no question are: (1) Stångenäs, near Roe, in the Parish of

Bro, Bohuslän, Sweden; (2) Mullerp, Denmark; (3) Svaerdborg, Sweden; (4) Sandarna, Sweden.[34]

Of these, the only useful specimen for racial deductions of any consequence is that of Stångenäs, consisting of a brain case, a femur, and a tibia. These were the bones of an extremely tall man, 181 cm. in height,[35] with long legs, particularly in the lower segments. The femur and tibia show all the peculiarities of form and development associated with Upper Palaeolithic man. The brain case, which is of extreme length, has an index of 71.9, a broad forehead, and prominent browridges. Fürst, who has studied this fragment carefully, assigns it without question to the Upper Palaeolithic racial group, especially to the central European Aurignacian.[36]

The Mullerp and Svaerdborg finds consist of a child's mandible each,[37] and a few broken fragments of other bones. That of Sandarna is limited to one long bone. For further evidence of the racial composition of Maglemose man, we must turn to northern Germany.

In northern Germany, which forms a part of the North European Mesolithic area, a number of skulls, found under varying circumstances, have been attributed to all three Mesolithic periods. It is difficult, if not impossible, to verify the alleged age of any one of them.

Among the most likely are two adult skulls, and one adult and three infantile mandibles, dredged from the bottom of the Pritzerber Sea, northwest of Brandenburg on the River Havel.[38] Although they came from a layer of blue clay underlying peat on the lake bottom, the exact geological age of these formations cannot be established. Antler and bone artefacts recovered from the same clay belong to Periods I, II, and III of the Mesolithic.[39] The two skulls are probably female, although the sex has not been conclusively determined. Both are of dolichocephalic type, with indices of 71; both have certain early European characters such as alveolar prognathism, strong browridges, high temporal crests, marked supramastoid ridges, and relatively large teeth. But the two differ in some respects; number one is large headed, short faced, and chamaerrhine, and number two of small capacity, very long faced, and mesorrhine. But both have only moderate bizygomatic diameters.

[34] Clarke, J. G. D., *op. cit.*, pp. 133–136.

[35] Calculated by two of Pearson's formulas. Stat. = $71.272 + 1.159 \times (F + T)$, and Stat. = $71.443 + 1.22F + 1.08T$.

[36] Fürst, Carl M., **FKVA**, vol. 20, 1925, pp. 274–293.

[37] The so-called *Homo kiliensis*, a child's skull, may also date from this period, but the evidence is not sufficient for certainty.
Clarke, *op. cit.*, p. 133.
Reche, O., **AFA**, vol. 21, 1925, p. 176.
Kossinna, G., **MannusB**, #6a, 1928; *Ursprung und Verbreitung der Germanen*, pp. 134–142.

[38] Reche, O., **AFA**, vol. 49, 1928, pp. 122–190.

[39] Clarke, *op. cit.*, p. 134.

A careful comparative study of these two crania places them both without difficulty into the female series of Upper Palaeolithic skulls; the greatest similarity is between number two and the female of Obercassel. Although the two Pritzerber crania differ widely in size and in face form, these differences can be matched in the Upper Palaeolithic group. The adult male mandible found with the Pritzerber crania is large, wide, high, and has everted gonial angles; it belongs to the same racial category as the crania. Typologically, these Pritzerber See remains are Mesolithic, for the two skulls could be female counterparts of Stångenäs, but to which of the three sub-periods they belong, we cannot tell.

The Anthropological Institute of Kiel University possesses a number of skulls from Schleswig-Holstein of purported Mesolithic age, most of which were removed from Kiel Harbor or the Kaiser Wilhelm Canal, during dredging operations. Others were simply dug up from peat deposits by farmers draining their bogs. Dates of varying accuracy may be assigned to seven of these specimens; all seven belong to the physical type of which Stångenäs may be a male, and the Pritzerber See crania female, examples.[40]

Four of them have been dated by pollen analysis;[41] three being assigned to the earliest Litorina transgression, and presumably to the very end of Period II, or Maglemose, archaeologically; and a fourth to full Litorina, thus probably Period III, or Ertebølle. The other three specimens, including the Ellerbek skull, which was dredged from submerged land in Kiel Harbor, may be dated, very tentatively, only by their associations with implements.

Thus, so far, we have found only dolichocephalic crania of European Upper Palaeolithic type associated with early post-glacial Mesolithic remains in northern Germany, as well as in Scandinavia. But there are other skulls, of dubious Mesolithic association, which are brachycephalic. These include the skulls of Plau, Mecklenburg; Dömitz, from the bed of the Elbe; and Spandau, from the mouth of the Spree. All three could fit very easily into the brachycephalic group from Ofnet, and if they are not Mesolithic, show the northward movement of that type in later times.[42]

Before concluding this survey of racial associations in the Mesolithic of

[40] Aichel, Otto, *Der deutsche Mensch.* The specimens referred to are B 5, KS 11032, KS 11254b, B 38, B 34, B 37, B 10.

[41] With newly exhumed skulls, Professor Aichel sent earth or peat from the cranial cavity to palaeobotanists; with specimens which had lain for years in museums, he gathered earth from the ear holes. This method does not always yield certain results, for sometimes the samples do not contain enough pollen for statistical study.

[42] Clarke, J. G. D., *op. cit.*, pp. 133–136.
Reche, **AFA**, vol. 49, pp. 122–190.
Kossina, G., **MannusB**, #6a, 1928, p. 144.
Kossina, G., *Die Indogermanen*, **MannusB**, #26, 1926, p. 16.

northwestern Europe, we must not fail to mention the parallel situation in the British Isles. Briefly, during the Upper Palaeolithic there are no true Solutrean or Magdalenian deposits in Britain, but the Aurignacian continues, to develop into an early Mesolithic culture called Creswellian. This in turn is later influenced by Azilian cultural diffusion from western France and northern Spain. The Aurignacian which came to England, and from which Creswellian developed, apparently came from central Europe.[43]

During the Mesolithic, a northern extension of Creswellian, strongly mixed with Azilian, extended to southwestern Scotland, where it has been found in the Oban caves of Argyllshire. The deposits of some of these caves date from Late Atlantic time, subsequent to the maximum Litorina transgression, during which period the caves were formed. This would roughly correlate the remains which they contained with Period III in Scandinavia. We must remember, however, that, although a few stray Maglemosian finds have been made in eastern Scotland, the land connecting Scotland with Denmark in the Boreal period had since sunk below the North Sea, and skeletal material from the Oban caves cannot be closely related in a cultural sense to that from Scandinavia.

During the last century, a number of these caves, when excavated, yielded skeletal material dating from the Late Mesolithic through the Bronze and Iron Ages into modern times. One of the sites, the MacArthur cave, contained some artefacts which have been recognized as Azilian,[44] as well as two male skulls, of which one at least is probably contemporaneous with the deposit.[45]

This specimen, called skull B, is very similar to the Stångenäs fragment in Sweden, with nearly identical vault dimensions, a cranial index of 70, a broad forehead, and heavy browridges. The sagittal arcs of the skull, the breadths and heights of the orbits, the depressed root of the nose, the breadth of the face, and the height of the mandible, are all typical of the purely long-headed variety of the Upper Palaeolithic European racial group. From the photographs [46] it is possible to make further observations, and even to reconstruct tentative values of additional measurements. The bizygomatic facial breadth was greater than the breadth of the vault, and the nose was leptorrhine.

Oban man is, in short, an ideal example of the central European Aurignacian physical type. As far as this one specimen is concerned, the initial

[43] Garrod, Miss D. A. E., **RBAA,** Pres. Ad., sec. H., vol. 4, 1938, pp. 1–26, viz. p. 23.

[44] Abbé Breuil (**PSAS,** vol. 55, 1921, p. 163) states that the site is fundamentally Creswellian influenced by a strong Azilian admixture, with faint Maglemose traces.

[45] Turner, Sir W. (**TRSE,** vol. 51, 1914–15, pp. 211–214), states that skull B actually lay in the shell deposit, while skull A was taken from the black earth above it.

[46] Turner, p. 213.

Upper Palaeolithic invasion of the British Isles was still represented, many thousands of years later, by its original racial type.

(9) SUMMARY AND CONCLUSIONS

The Mesolithic Age in Europe is the time gap, lasting nine thousand years, between the end of the glacial period and the Neolithic. Peoples living in a Mesolithic stage of culture continued to obtain their food by hunting, fishing, and the gathering of wild vegetable products as they had in the Palaeolithic; but they now possessed one domestic animal, the dog. Technologically, the introduction of the microlithic blade, which could be used in composite tools, and the invention of the wood chopping axe, further distinguish this period.

With the retreat of the last ice cap, the fertile grasslands of the Sahara and of southwestern Asia began to dry, game became scarce, and the rain belt moved westward and northward. The microlithic technique, which had been employed during late Upper Palaeolithic times in North Africa and the Near East, was carried across the Straits of Gibraltar and through the Caucasus and South Russia into Europe, where it spread northward and northwestward, eventually affecting the industries of the entire continent. At the same time, it was diffused into Palestine.

This cultural diffusion to the north and northwest was accompanied in the Late Mesolithic or followed in the Early Neolithic by the invasion of a people new to Europe, a relatively small-headed, short statured, effeminate looking, Mediterranean type, of direct Galley Hill deviation, and ancestral to one branch of the modern Mediterranean race. These Mediterraneans also entered Palestine in Late Mesolithic times.

A population of Upper Palaeolithic derivation, compounded of early Aurignacian and Magdalenian elements, moved northward from Spain and the Pyrenees to western France and Germany, if not farther. In the vanguard of the northern movement was a large, broad-faced, brachycephalic type reminiscent of the brachycephalic element resident in Algeria at an earlier date. Although its geographical origin is not certain, it was definitely a member of the middle and late Aurignacian group of mixed *sapiens*-Neanderthaloid derivation.

In eastern Europe it is possible that the older Palaeolithic race was reinforced in early post-glacial times by an increment from the Near East, although this cannot as yet be clearly demonstrated. Invasions parallel to that which crossed Gibraltar probably entered Europe via the Caucasus, but there is at present very little evidence to support such a theory. In northwestern Europe, especially in Scandinavia and Britain, where the last glacier had its main centers and lasted the longest, Upper Palaeolithic man of the central European variety persisted through the Mesolithic, and

it is to this corner of Europe that we must look for a maximum survival of glacial age European man into the present time. Similarly, the other main type which we traced during the Palaeolithic—the long-faced and long-legged ancestral Hamite of East Africa—persisted in East Africa into the Mesolithic without change.

Although most if not all of the innovations, both racial and cultural, which reached Europe during the Mesolithic Age, came from North Africa and also perhaps from points farther east, we may suppose that events of far greater importance to human history were going on at this time on the continent of Asia. There the peoples of the western plateaux must have already begun the mastery of the animal and vegetable worlds which was to permit them to increase in numbers, and to overflow into Europe, thus marking the beginning of the Neolithic period in the latter continent. If we are to understand the racial changes which affected the population of Europe at the end of the Mesolithic, we must next devote our attention to these imminent invaders.

Chapter IV

THE NEOLITHIC INVASIONS

(1) INTRODUCTION

The word *Neolithic* has two meanings, one purely technical, and the other of broader implications: (1) the manufacture and use of polished stone implements, in the form of axes, adzes, gouges, chisels, and hoes; (2) the conquest of the procreative forces of the biological world, through agriculture and animal husbandry. These two definitions, implying tools on the one hand and food on the other, do not always overlap, for some peoples may be considered Neolithic in one of the two senses only. Of the two, only the second is of really vital importance in human history. In fact, the change from food-gathering to food-producing was the greatest step in human development since the invention of language.[1]

The initial adoption of a Neolithic economy occurred, however, at few centers on the earth; one in the Old World and another in the New are all of which we can be sure at present. In the Old World, the plants and animals which were suitable for domestication ranged in a wild state in the highland zone from Anatolia to the Indus, with some species extending out along the southern shore of the Mediterranean. Abyssinia may have been a separate center for the domestication of some grain plants, but probably not of animals. Perhaps when the Yemen shall have been studied by economic botanists, this fertile highland on the other side of the Red Sea will assume a like importance.

In the millennia during which the glacier was retreating to its Scandinavian center and growing thinner, the climatic zones which made a well-watered grassland of this entire plateau belt moved northward, and the regions in which Old World civilization originated grew gradually drier. Afghanistan and Iran, now for the most part nearly desert plateaux, were then fertile; in Egypt the valley of the Nile was a string of swamps and jungly lakes, full of crocodiles and hippopotami.

It is now generally believed, although still unproven, that agriculture and the domestication of animals did not arise in the three valleys of the Nile, Tigris-Euphrates, and Indus, but in the highlands between them. The river valleys became important as centers of civilization because seasonal flooding and the deposit of fresh alluvium made it impossible for

[1] Childe, V. Gordon, *The Dawn of European Civilization; The Most Ancient East; The Danube in Prehistory; New Light on the Most Ancient East; Man Makes Himself.*

primitive farmers to exhaust the soil, thus permitting sedentary residence; furthermore, the development of irrigation and drainage canals were public works necessitating social solidarity, and kingdoms arose here while the highlanders kept to their villages and fought their feuds, as many of them still do today.

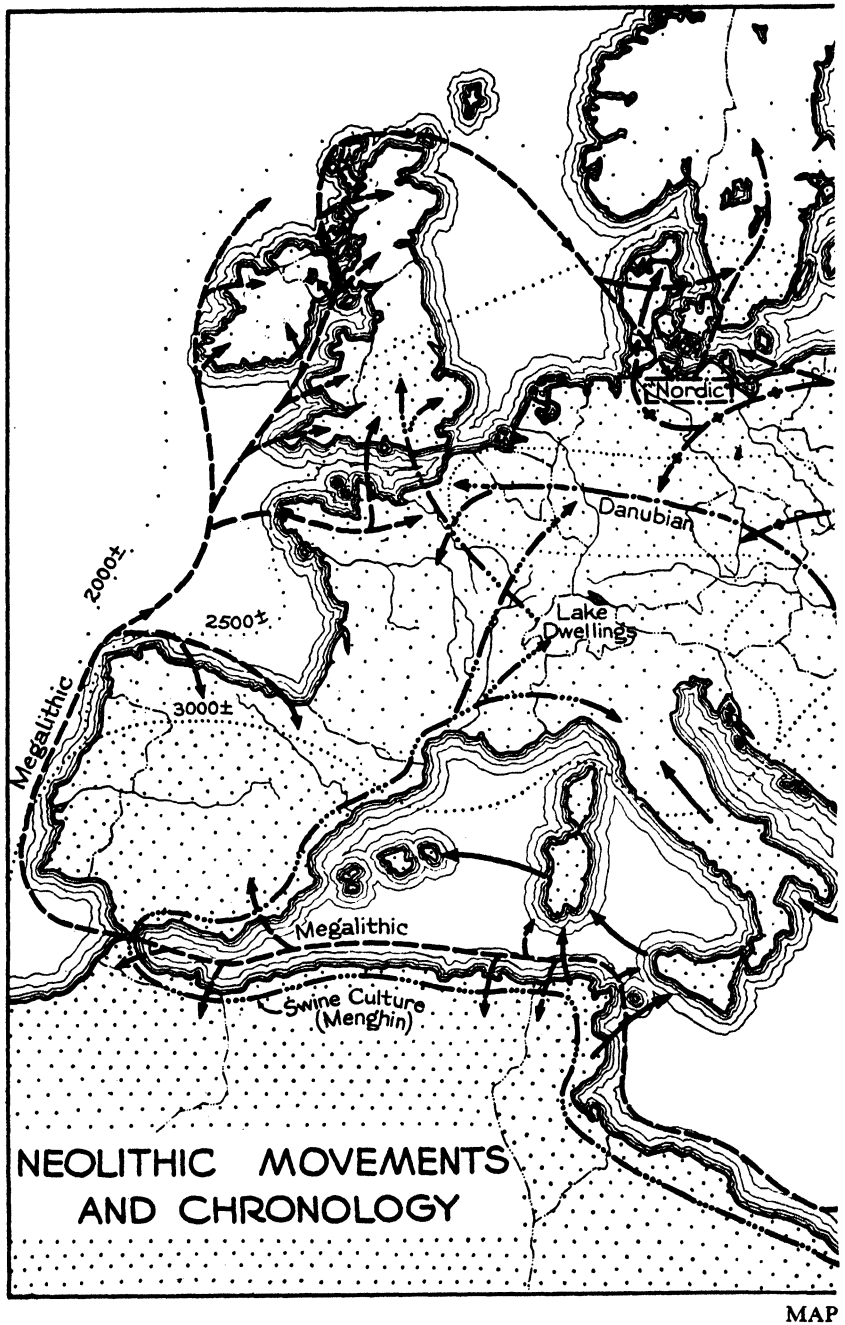
As Childe has pointed out, the acquisition of a new and more productive means of economic life has as one of its first effects an increase in the population. Agriculture and the domestication of animals did not appear in one day. The acquisition of a full Neolithic economy may have taken one or more millennia, and it only very gradually replaced hunting and collecting. The primitive slash-and-burn system, which must have been the first followed, and which was the earliest in Europe, prevents intensive use of the soil and promotes a slow but nevertheless positive type of nomadism.

The desiccation which followed the movement of the rain zones northward resulted initially in the migration of peoples into Palestine, North Africa, and southern Europe, in the form of the Mesolithic invasions, which we have already studied. These movements were not extensive, however, because the new economy of food production permitted a greater utilization of the drying soil on which wild animal and vegetable life, useful to man, had grown scarce. For a while emigration was unnecessary; but when the inevitable population increase had come, western Asia overflowed, and farmers moved into regions where the climate which had formerly blessed their homelands now prevailed.

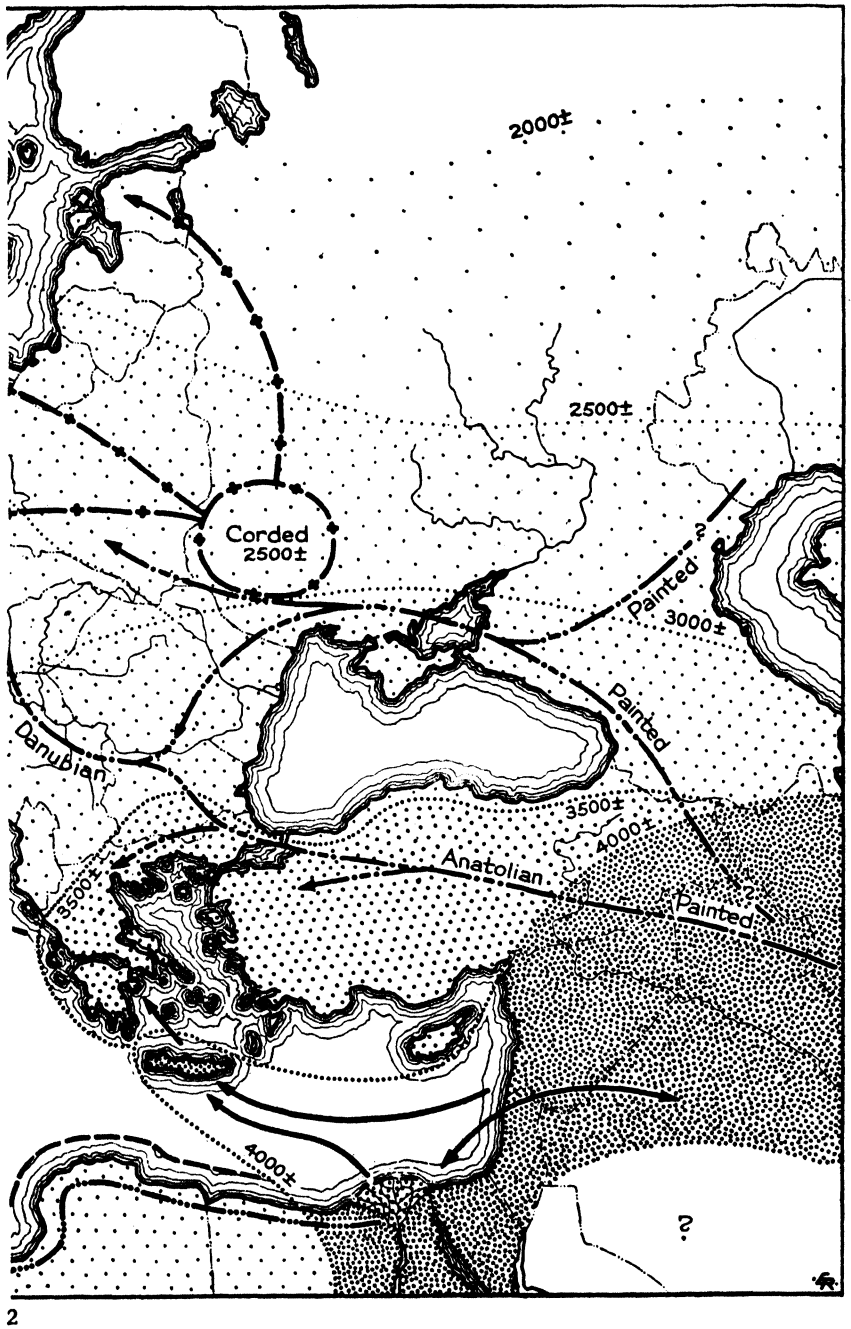
The desiccation which followed the shifting of the cyclonic storm belts did not become complete until what is called, in northern Europe, Atlantic time, that is, in the neighborhood of 5000 B.C. Only by this time had Europe, south of the newly formed northern forest, really become climatically what the highland belt had been before—a temperate, well-watered parkland, instead of a chilly, treeless plain.

The same general date, 5000 B.C., may be tentatively set as the time of the beginning of agriculture and animal domestication. It was not until almost 2000 years later, however, that the disciples of this new economy were to expand and invade more than the threshold of Europe.

The Neolithic invaders of Europe, seeking new lands for farming and grazing, came as a further result of the same environmental shift which had impelled the earlier Mesolithic invaders, whom they supplemented without a gap, and with whom they blended. But the Neolithic invasion was not as simple as the Mesolithic. As the new economy spread, it affected a number of peoples, whose reactions were not all the same. Europe, the new stronghold of a lost climate, was broached in different places and in different ways.


NEOLITHIC MOVEMENTS
AND CHRONOLOGY
Nordic
Danubian
Lake
Dwellings
2000±
2500±
3000±
Megalithic
Megalithic
Swine Culture
(Menghin)

MAP


2000±
2500±
Corded
2500±
Painted
3000±
Painted
Danubian
3500±
4000±
Anatolian
3500±
Painted
4000±
?

2

Map 2 will show, in a very general sense, the time scale of Neolithic invasions into Europe, and the routes by which these invasions may have come. It is to be noted that Crete became Neolithic before any of the European mainland, followed by Greece and the land near the Bosporus; eventually these agriculturalists spread into all the northern Mediterranean lands by sea. Meanwhile, other Neolithic farmers had been moving along the coast of North Africa from Egypt, and had crossed over Gibraltar to invade Spain. Hence they migrated northward and eastward, as far as the Swiss lakes and the Rhine.[2] Their agriculture, and their pig, sheep, and cattle husbandry, eventually spread over most of western Europe, and even into England. At the same time still other farmers, in this case coming from Anatolia, or southeastern Russia, or both, were moving up the Danube, and eventually established themselves in the fertile valleys of Moravia and Bohemia, and even farther westward until they met the stream coming northward over Gibraltar.

These three movements were the primary invasions which brought a new, agricultural population into Europe. Later in the Neolithic there were two other movements of a different character. One was that of the Megalith-builders, who sailed through the Straits of Gibraltar and skirted the western shores of Europe to the British Isles and Scandinavia. These seafarers probably introduced the new economy to the northern isles and Scandinavia. Then there were the Corded people, so-called on account of the decoration on their pottery—who came from some mysterious point in southern Russia or the steppes of western Asia north of the plateau, and who were probably less dependent on farming than on pastoral nomadism and trade. Just as the Megalithic people carried civilization to the far western corners of Europe by sea, so the Corded people introduced the new enlightenment into the north, where the old hunting and fishing life survived.

Five invasions, then, converging on Europe from the south and east, brought a new population to Europe during the third millennium B.C., and furnished the racial material from which living European populations are to a large extent descended.

(2) THE NEOLITHIC AND THE MEDITERRANEAN RACE

In Europe, the Neolithic is primarily the period of the Mediterranean race, in one form or another. It was, apparently, the Mediterraneans who accomplished the change to a food-producing economy elsewhere, and who expanded into the territory of the food-gatherers.

These Mediterraneans, while surprisingly homogeneous in some respects, may be segregated locally and typologically into sub-groups on

[2] Menghin, O., *Weltgeschichte der Steinzeit*, pp. 294–302.

the basis of a few characters. Before proceeding much further with our geographical-historical reconstruction, it will be well to define what we mean by Mediterranean, to compare it with other races which we have already met, and to specify its principal subdivisions.

By Mediterranean, in the skeletal sense alone, we mean the wide family of closely knit racial types which are long headed, orthognathous, mesorrhine or leptorrhine, narrow faced, and of medium head size, descended from the general Galley Hill stock, and related to Combe Capelle and Afalou #28. Mediterranean, in this sense, is the name by which we propose to designate that one of the two major racial elements, concerned with the development of white peoples, which completely lacks Neanderthaloid ancestry. It differs from the major Upper Palaeolithic group of Europe and northern Africa in several respects, as shown on page 84.

The "Mediterranean" racial family is just as "white," in the larger meaning of the word, as the Upper Palaeolithic family. Its chief differences from the latter are: a smaller brain size, a moderate body size, and a lack of the excessive specializations which characterize the northern group. The Mediterranean group seems to be of purely *sapiens* ancestry, without Neanderthaloid or other mixture.

Before the Neolithic, the principal branches of the Mediterranean family must already have come into existence. Some Mediterraneans were probably white skinned, and others brown; it is also possible that the differences in hair and eye color which so strongly distinguish living Mediterranean sub-varieties had already come into existence.

We cannot speak with authority about Nordics until we meet blondism in the flesh, nor make profitable surmises about them until we find it in literary references and artistic representations. We must not, therefore, let differences in pigmentation and soft parts confuse our understanding of the skeletal unity of the Mediterranean race.

It can be shown that Sumerians who lived over five thousand years ago in Mesopotamia are almost identical in skull and face form with living Englishmen, and that predynastic Egyptian skulls can be matched both in a seventeenth century London plague pit, and in Neolithic cist-graves in Switzerland. Modern dolichocephalic whites or browns are very similar in head and face measurements and form. The Nordic race in the strict sense is merely a pigment phase of the Mediterranean.[3]

On the basis of the material to be covered in this chapter, we may distinguish the following branches of the general Mediterranean or Galley Hill group:

[3] Popularly, the word "Nordic" is frequently applied to a blond or pigmentally intermediate conglomerate type or group of types in northern Europe, which contains other than blond Mediterranean elements.

Upper Palaeolithic	*Mediterranean*
1. Great size of brain case.	Brain size variable, but usually moderate.
2. Mean skull length about 198 mm. in males.	Mean skull lengths between 183–193 mm. in males.
3. Vault height variable, usually moderate.	Absolute vault height has the same range in absolute dimensions, or higher, but usually higher in relation to other diameters. Within the Mediterranean-Galley Hill group, differences of vault height serve as diagnostics of race or sub-race.
4. Head form variable. Local means 70–72 in some cases, 74–75 in others.	Same.
5. Strong tendency to become brachycephalic, manifest in some local branches.	Tendency to brachycephaly not manifested by advent of Neolithic in areas yet known.
6. Thick vault, heavy relief of muscle attachments.	Vault medium to thin, muscular relief on vault as a rule slight.
7. Browridges and development of nuchal lines on occiput strong.	Browridges and nuchal lines variable, medium to weak.
8. Face variable in length, frequently short.	Same, but some notably long-faced exceptions.
9. Face very broad, bizygomatic diameter over 140 mm. in males. Zygomatic arches greatly bowed.	Face usually narrow, 127–133 mm., zygomatic arches weak and laterally compressed.
10. Orbits very wide and low.	Orbits of moderate proportions.
11. Distance between orbits great.	Distance between orbits slight.
12. Nasal skeleton prominent.	Nasal skeleton prominent in some types, but not in all.
13. Sub-nasal segment of face height relatively great.	Sub-nasal segment of face height relatively slight.
14. Mandible thick, heavy, with great symphysial height, wide bicondylar and bigonial diameters; prominent, often bilateral chin.	Mandible variable; usually light, of small symphysial height, and narrow in both lateral diameters, chin moderate or pointed. In some types, however, the mandible approaches the Upper Palaeolithic form in height, but not in breadth.
15. Stature variable, but most characteristically tall, mean probably about 172 cm.	Stature variable, but most characteristically short, types vary from 159 to 172 cm. in means.
16. Bodily build usually robust, shoulders very broad, chests voluminous, hands and feet large.	Bodily build usually linear, hands and feet smaller, weight probably less.

(1) *Mediterranean Proper* (hereafter meant when the word "Mediterranean" is used alone): Short stature, about 160 cm.; skull length 183–187 mm. male mean; vault height 132–137 mm. mean; cranial index means 73–75; browridges and bone development weak, face short,

nose leptorrhine to mesorrhine. Type already met in Portugal and Palestine in Late Mesolithic. Represents the paedomorphic or sexually undifferentiated Mediterranean form, and often carries a slight negroid tendency.

(2) *Danubian:* The same in body size and build, skull length and cranial index the same; individually, the index goes to 80. Vault is higher than breadth, means 137–140 mm. Nose mesorrhine or chamaerrhine.

(3) *Megalithic:* Tall stature, means 167–171 cm., slender build; skull length over 190 mm.; cranial index 68–72 means, individual range below 78; vault moderate in height, less than breadth; forehead moderately sloping, browridges often of moderate heaviness, muscular markings stronger, skull base wider, face medium to long, nose leptorrhine, mandible often deep and moderately wide. The East African Elmenteitans represent an individual and extreme form of this. It represents a gerontomorphic or sexually differentiated Mediterranean or Galley Hill form, and in cranial features is closer to Galley Hill itself than any other branch.

(4) *Corded:* Tall stature, means 167–174 cm.; build linear but muscular, perhaps heavier than the Megalithic; extremely long-headed, 194 mm. mean. Vault of great height, means over 140 mm., exceeding breadth; browridges and muscular markings medium to strong; face very long, and of slight to moderate breadth; mandible deep and chin marked, but narrow through gonial angles. Nose leptorrhine, often prominent. This type, in western and northern Europe, approaches in some respects the Upper Palaeolithic type with which it mixed.

(5) *Other Forms:* Include mixtures between the four named, as well as others which are also intermediate but perhaps ancestrally undifferentiated. The later "Nordic" forms are intermediate. In Asia Minor and the Irano-Afghan plateau appear forms noted for great prominence and convexity of the nasal skeleton, and lack of nasion depression. Since these features are found on individuals of varying size and proportions, as well as brachycephalic races of the same neighborhood, they seem to represent some local genetic tendency, and cannot be considered the exclusive property of a given race. However, one might name the small variety found in Asia Minor *Cappadocian*, while a larger form commoner farther east, and metrically close to the Corded, may be called *Afghanian.*

The names given the racial divisions outlined above have been chosen with the intention of avoiding close reference to living races, since they are based on the skeleton alone. *Mediterranean* forms an exception; it is so well known and firmly established that it cannot be changed. In this particular case, we may be reasonably sure of the character of the soft parts, owing to the antiquity of accurate realistic portraiture in Egypt, Crete, and Mesopotamia, as well as to mummification.

The names Danubian, Megalithic, and Corded, have been deliberately taken from archaeology since, as will be shown, the types so designated were closely linked, during the Neolithic and even later, to the cultural entities with which they are thus identified.

It is hoped that the use of these labels will eliminate the necessity, in the rest of this chapter, of elaborate description.

(3) IRAN AND IRAQ

Unfortunately for the compiler of a general book, both the archaeology and the somatology of the Iranian plateau and of Mesopotamia are in their respective infancies. City after city, and village after village, remain undug, while thousands of skulls, some excavated and discarded, and others still in the ground, remain unmeasured and unpublished. Despite the notable work done at al 'Ubaid, Kish, Ur, Warka, Susa, Persepolis, Rayy, and other sites, the archaeologists have not yet found the beginnings of Near Eastern civilization. Until recently, no single unquestionably Neolithic site had been discovered in the whole of Asia Minor, Mesopotamia, or the Iranian plateau over to India; at present several sites have been located in Anatolia and Armenia.[4] In the Tigris-Euphrates Valley, the Neolithic material, if it exists, must be buried by many feet of alluvial soil. In the eastern highlands, if it exists, it should not be hard to find. The difficulty is that no one has seriously looked for it. The claim of this whole highland and riverine zone to priority in the development of the Neolithic economy cannot yet be confirmed or refuted.

There is, however, another claimant equally lacking in credentials—the plain of west-central Asia, north of the plateau, and east of the Caspian. In the grasslands drained by the Oxus and Jaxartes the great nomadic cultures, associated with Indo-Aryan-speakers in the oldest traditional times, and later with the Turks, had their bed of germination. From this center, from time to time, invasions and migrations started in several directions. One was the movement of the Aryan ancestors into India, about 1400 B.C.; another the Iranian invasion of the plateau which bears the name and whose inhabitants speak the language of the invaders. A school, founded by the Indo-European philologists of the last century, and supported, although with different *dramatis personae*, by the modern Turks, would make of these vast plains the germinating-bed of Old World food production.

Commencing with the Iranian plateau, we may consider skeletal material which antedates the arrival of the Iranian-speaking immigrants. Five crania from Luristan and the region directly to the north, in western

[4] Pittard, E., **ASAG**, vol. 7, 1937, pp. 389–391.
Field, H., **AJSL**, vol. 55, 1938, pp. 101–111.

Iran, represent the pre-Aryan period; three males and two females,[5] dating from 2000–1100 B.C., are all variants of the general Mediterranean type, in Cappadocian and Afghanian directions. An Early Copper Age skull from southern Baluchistan, which may date from the third millennium B.C., is the same.[6] We may surmise that the ancestors of the bulk of the present plateau population had arrived by the beginning of the third millennium.

In Mesopotamia, the earliest cultural remains have been found in Sumeria. Here there has been recognized a long predynastic period, subdivided into three phases—al 'Ubaid, Uruk, and Jemdet Nasr. These three probably occupied the fourth millennium B.C. The last two at least were Copper Age cultures, while the al 'Ubaid culture proper, as exemplified by the eighteenth to fourteenth levels at Warka, may possibly have its roots in a true Neolithic.[7]

One grave at Warka, in level 14, belongs to the latter part of the al 'Ubaid period, probably about 3700 B.C. The skull contained in it is said to be dolichocephalic. Two skeletons from perhaps equally early graves at al 'Ubaid itself powdered upon exposure, and could not be measured. Hence our knowledge of the people of the fourth millennium B.C. in Mesopotamia, based on indubitably contemporaneous remains, is practically zero.

A series of seventeen crania from al 'Ubaid[8] (see Appendix I, col. 4), which may be predynastic or early dynastic, belong without exception to a type which has been called Eurafrican, and which has been the most numerous and most characteristic element in the population of Mesopotamia from the time of the marsh dwellers at al 'Ubaid to the present day. These skulls are large, heavy, and purely dolichocephalic. They belong to the larger- and longer-headed Mediterranean division, nearest in vault size and form to the earlier Galley Hill and Combe Capelle. They differ in one important respect, however, from most European skulls of the same general type, in that their nasal bones are extremely prominent and highly placed. These early Sumerians, like the inhabitants of the Iranian plateau, had already acquired the projecting, aquiline noses so characteristic of the modern Near East. Like the plateau dwellers, these early Sumerians were Afghanian in race.

Mesopotamia is not, like Egypt, an isolated valley, for it may be entered

[5] Vallois, H. V., "Notes sur les Têtes Osseuses," in Conteneau, G., and Ghirshman, A., *Fouilles de Tepe Giyan.*

[6] Sewell, R., and Guha, B., *Report on the Bones Excavated at Nal*, **MASI**, vol. 35, 1929, app. 5, p. 56.

[7] Jordan, J., **APAW**, Jh. 1932, #2.

[8] Keith, Sir Arthur, "Report on the Human Remains, Ur Excavations," vol. 1: in Hall, H. R. H., and Woolley, C. L., *Al 'Ubaid.*

without great difficulty from the highlands to the east and north, while it forms a natural goal for the inhabitants of the Arabian uplands, made mobile by the fickle rainfall of the pastures. The history of Mesopotamia has consequently been a sequence of infiltrations and invasions from both the highland zone and the deserts, for the country feeds the city with men, and not the reverse.

In studying the racial history of Mesopotamia from the third millennium B.C. onward, we must remember this almost constant influx, and observe how it affected the Sumerians and the Semitic-speaking kingdoms. The series of skeletal remains at our disposal, other than the series from al 'Ubaid, include: (a) a series from Kish, from graves which may be dated at some time close to 2900 B.C.; (b) another from the same site, from fourth dynasty graves, prior to 2500 B.C.; (c) skulls of the third dynasty of Ur, dated about 2300 B.C. (d) Neo-Babylonian crania, from between 800 and 400 B.C. (e) Skulls from Kirkuk dated at the fifth century A.D.[9]

In all, well over a hundred skeletons have been studied. Most of the skulls belong to the "Eurafrican" type already described, but two other types are represented in most of the series. One of these is an ordinary Mediterranean with a smaller skull and a higher cephalic index, which ranges between 70–80 and averages about 75. This Mediterranean type is more fragile, less rugged, shorter faced, and smaller in body size. This is apparently not an original Sumerian type, for it is completely absent in the earliest series from al 'Ubaid and Kish. It first appears well after 3000 and probably after 2700 B.C. in the fourth dynasty graves at Kish (see Appendix I, col. 5), and from then on seems to persist in all of the samples, except for the late Kirkuk series in the north. Like the larger "Eurafrican" this smaller Mediterranean type may still be distinguished in the living population of Iraq.

The "Armenoid" racial type, which is the third one claimed in Mesopotamia, begins with the earliest Kish graves and continues through the Babylonian period. The identification of this type is not wholly certain, however, for very few actually brachycephalic skulls have been found, and, since facial portions of these are usually damaged, it is impossible to define the type clearly. Most of the so-called Armenoid skulls are mesocephalic or sub-brachycephalic, but, in a few instances, the cephalic index runs really high, in an extreme case, to 89. The occiputs of these skulls are said to be flat, the browridges heavy, and the capacities great. Although many of the skulls which have been called Armenoid may rep-

[9] (a) Penniman, T. K., in Watelin, L. C., *Excavations at Kish*, vol. 4. (b) Buxton, L. D., in Langdon, *Excavations at Kish*, vol. 1; also Buxton, L. D., and Rice, D. T., **JRAI**, vol. 61. (c) Keith, Sir A, "Report on the Galilee Skull." (d) Buxton, L. D., *vide supra*. Buxton and Rice, *vide supra*. (e) Ehrich, R. F., Appendix to Starr, Richard, F. S., *Nuzi*, vol. 1.

resent merely the rounder headed extreme of the total group, it is nevertheless probable that a planoccipital brachycephalic strain actually penetrated Mesopotamia during the third millennium B.C. Although it has since increased in numbers, it still forms but a minority.

Except for these few brachycephals, none of the invasions or cultural movements into Mesopotamia in historic times has changed the population in any perceptible way. This would indicate that the regions which

FACIAL TYPES IN SUMERIAN ART

FIG. 17

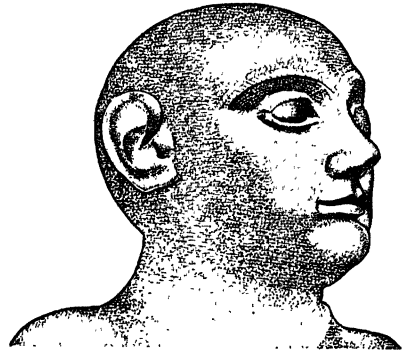


FIG. 18

FIG. 19

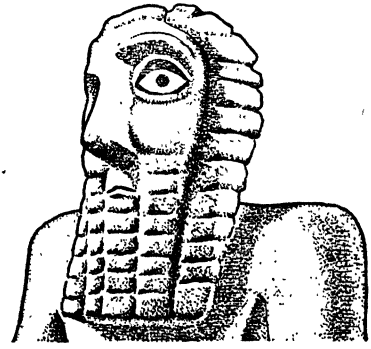


FIG. 20

Fig. 17, Frankfort, H., Jacobsen, T., and Preusser, C., **COIC,** #13, 1930/31, p. 70, Fig. 27. Fig. 18, King Gudea, after Woolley, C. L., *The Development of Sumerian Art.* London, 1935, Fig. 62a, p. 115. Fig. 19, from excavations at Khafaje, Expedition of the Univ. of Pennsylvania Museum and of the American School of Oriental Research, under Dr. E. A. Speiser, *New York Sunday Times*, Section 9, June 27, 1937. Fig. 20, same source as Fig. 19.

acted as feeders of immigrants to Mesopotamia were themselves similar racially. The plateau people of Iran, therefore, were probably in the main long-headed. The inhabitants of northern Arabia who had entered the valley from time to time, and who still come to the banks of the Euphrates to water their flocks, belong likewise to the general Mediterranean family, and examples of both Afghanian and Mediterranean types may be selected from the living tribes without difficulty. It is quite possible that the first appearance of the finer and smaller Mediterranean type in Mesopotamia came with the arrival or assimilation of the Semites.

The Sumerian sculptors have left behind them records in stone which may piece out the evidence of the skulls. These records consist of bas reliefs, which are of conventional type, and some really excellent portraits in the round. The reliefs show wiry, athletic men with large, often aquiline noses. They are obviously normal white men of some Near Eastern variety, just as one would expect. The portrait busts, of which three examples are shown (Figs. 17, 18, and 19), seem really to depict individual men rather than conventional types or ideals. Figure 18 represents the oft-sculpted King Gudea, who has a roundish face and a nose less prominent than the bas-relief ideal. Figure 17, which looks less posed, bears the sly expression of a Baghdad shopkeeper of the present day. In both heads the browridges are absent, and the eyebrows concurrent. In these as in most examples of Sumerian sculpture, there is no evidence of hair distribution or hair form which is, however, conventionally shown in archaic statues of gods (Fig. 20), dating from early dynastic times. In these, the beards are full, the hair straight or wavy.[10]

FIG. 21. ASSYRIAN.
After Schäfer, H., and Andrae, W., *Die Kunst des alten Orients*, 1925, p. 521.

In the later Babylonian and Assyrian sculptures, which depict Semitic-speaking populations, we find a profusion of beard and head hair as with the early Sumerian gods; the hair is wavy or curly, and the beard exaggeratedly abundant. (See Fig. 21.) The eyebrows meet over the root of

[10] Frankfort, H., "Oriental Institute Discoveries in Iraq, 1933–34," Fourth Preliminary Report, **COIC** #19, 1935.
Speiser, E., *New York Times*, Jan. 27, 1937.

the highly arched nose, and eyelids and lips are full. The bodies are conventionally thick-set, the arms and legs heavily muscled. The artists of Babylon and Nineveh were anthropologists at heart, for they chose a truthful rather than an imaginary ideal. Their kings and soldiers and slaves could step down from the walls and mingle with the crowds today.

Although Mesopotamia was one of the great centers of Old World civilization, and although its emissaries travelled hundreds of miles, and its cultural influences were so far-reaching that we may feel them even today, we must not attempt to link it directly with the Neolithic invasions which entered Europe. The farmers who sought rich fields and grassy meadows to the west of the Euxine and the Bosporus were not Sumerians or Babylonians, but peoples who had started their wanderings before the development of a metal age civilization, and who were affected only indirectly by cultural emanations from its center. Nevertheless, this somatological survey of early Iran and Iraq is of value in the larger problem of the white race, for it enables us to define clearly the physical characteristics of the Mediterranean types of man which were responsible for what may have been the world's earliest civilization, and of the surrounding regions from which it was fed, just as one could tell the physical types of France from a study of Paris or of Europe from a study of New York.

(4) CIVILIZED MEN IN EGYPT

Certainly the most satisfactory area in the whole world for the racial study of a people of antiquity is the valley of the Nile. Over four thousand Egyptian skeletons, covering a period of some seven thousand years, have received anthropometric attention. One Egyptian series, consisting of nine hundred males, is the most extensive group of crania of a single sex and from a single place ever assembled. It is possible, therefore, to study variability and change in this isolated valley with delicate precision, for in one district, the region of Upper Egypt about Abydos and Thebes, the cranial material is more abundant than that of any age from any other region of the same size in the world.[11]

Furthermore, from the beginning of dynastic times until the arrival of Islam, Egyptian painters and sculptors recorded faithfully, often in colors, the physical appearance of their living countrymen, as well as of many different kinds of foreigners. At the same time, the climate of the Nile Valley, and the skill of embalmers, have preserved intact the hair, skin, and dried muscles of both natural and artificial mummies, from the predynastic period onward. With this abundance of evidence, we should be nearly as familiar with the racial characteristics of the ancient Egyptians as with those of the people of our own day.

[11] Morant, G. M., **Biometrika**, 1925, p. 4.

Geographically, Egypt is not unified. In the first place, the Delta, which resembles early Sumeria in its climatic conditions, is a marshy series of water ways, continuous with the coasts of Palestine and Lybia, and easily attainable from both directions, as well as from the sea. It, and to a lesser extent, Lower Egypt, as well, forms an easy route of passage from Asia to North Africa without touching most of Egypt proper. It is possible, therefore, that even in dynastic times movements of racial importance passed from western Asia to North Africa over this coastal route, without affecting the population of Egypt in any notable way. Upper Egypt, on the other hand, is a narrow valley hemmed in by cliffs on either side. Beyond these cliffs lie plateaux, which during the pluvial periods were well-watered and covered with grass and game. There was only one gateway to Egypt from the south—down the Nile—and during the dynastic period the Egyptian kings kept garrisons on their southern boundaries to prevent immigration from this quarter.

The cyclonic rain belt which moved northward from the Saharan and Arabian deserts in the general post-glacial readjustment of climate also took a westward direction.[12] For this reason, a climate favorable for hunters and gatherers persisted longer in Egypt than in Mesopotamia. At the same time, this movement may have had much to do with the migration of peoples crossing North Africa from east to west, keeping ahead of the zone of serious desiccation. Morocco was the last of North Africa to dry, and in parts of that country cedar forests and grassy uplands still remain.

The archaeological sequence in Egypt, which has been well worked out, begins with the lowest Palaeolithic and continues without a gap until historical times. During the pluvial and early post-pluvial periods, however, the swampy tree-fringed valley was not the most favorable hunting ground, and Palaeolithic and Mesolithic food-gatherers ranged by preference over the open grasslands to either side, making only occasional visits to the river banks. As the plateaux grew increasingly arid, many of the hunters who did not migrate westward moved into the still moist valley, toward which the game upon which they lived must have been converging. One such concentration of food-gatherers is seen in the Sebilian culture of Upper Egypt.[13] The skeletal remains from this culture, which have not yet been published, are said to anticipate in physical type the predynastic, placing a fine Mediterranean type in pre-Neolithic times.[14]

In another part of Upper Egypt, the earliest known of the sporadic agriculturalists, who at the same time or soon afterward, began to exploit

[12] This summary of climatic changes in Egypt is based on Childe, V. G., *New Light on the Most Ancient East*, pp. 49–51.

[13] Childe, *op. cit.*, p. 35. [14] Leakey, L. S. B., *Stone Age Africa*, pp. 177–178.

the favorable environment of the Nile Valley, were the so-called Tasians, named after the type site of their culture at Deir Tasa. At the time of their occupation, this part of the Nile Valley was still swampy, with large trees growing at the fringes of the marsh. In view of these climatic conditions, it is estimated that this culture may have been introduced as early as 5000 or even 6000 B.C.[15]

Although the physical type of the Tasians has not yet been fully described, Brunton's preliminary notice informs us that the few skulls as yet found are large, thick-walled, and strong in muscle relief, with heavy browridges. The cranial form, while prevailingly dolichocephalic, includes some brachycephals.[16] The faces are broad, the orbits square, the lower jaws deep, wide, and square, with flaring gonial angles and projecting, bilateral chins. Judging from the drawings of one example published by Brunton, we may deduce that they were orthognathous, and in this case at least, mesorrhine. They seem to belong to a purely white category, and we may hazard a guess that they represent an Upper Palaeolithic strain of Afalou or Early Natufiian type, forming a link between Algeria and Palestine. They were not, however, important in the ultimate formation of the Egyptian people, for in subsequent times they seem, both culturally and racially, to have disappeared.

Another early Neolithic civilization of Egypt which left no clear traces in the dynastic culture was that of the Fayum people and the Merimdians of the Delta, who, contemporaneously with the Tasians, and following the Sebilians, grew barley, emmer wheat, and flax along the shores of the Fayum Lake and the estuaries of the Delta. They also kept herds of cattle, and especially of swine. Their technology bridges the gap between a Capsian Mesolithic and a full Neolithic. Their pottery, a thick black ware decorated by incision, resembles early ceramic types of Neolithic western Europe and of Anatolia.

The importance of these people is that they probably represent the prototype of the Neolithic agriculturalists who moved westward along the shore of North Africa to Morocco, and over into Spain, whence they spread the Neolithic economy, with emmer, flax, and swine, to the Swiss lakes and to the Rhine.[17] Although they may have had little importance for Egypt, they had much for Europe. Their appearance in the Fayum and the Delta is dated at about 5000 B.C., and their disappearance about 4000 B.C. One millennium later they or people like them appeared in western Europe.

The skulls of these people, which consist mostly of females and infants,

[15] Brunton, Guy, **Antiquity**, vol. 3, #12, Dec., 1929, pp. 456–457.
[16] Menghin, O., Lecture at Harvard University, April 6, 1937.
[17] Childe, V. G., *op. cit.*, p. 64.

are all dolichocephalic and Mediterranean. There is no trace of negroid influence, and the skulls are said to be larger than those of predynastic Egyptians, to be described shortly.[18]

After this excursion let us return to Upper Egypt, to a number of sites close to that section of the valley in which the Tasians had previously lived. From the type site, Badari, come the earliest skulls of a definitely Egyptian group which have yet been discovered. These Badarians lived about 4000 B.C., after the climate had become considerably drier than it was in Tasian times, so dry, in fact, that in many cases the skin and hair of their dead have been naturally preserved. The skin was apparently brunet white, while the hair was black or dark brown in color, thick, of fine texture, and usually wavy in form.

Although the Badarians, like the Tasians and Merimdians, still hunted and fished to enhance their larders and vary their diet, they lived primarily by agriculture and by herding cattle and sheep. Unlike the Merimdians, they raised no pigs. By hammering copper they were entering the transition from the Neolithic to the Metal Age. They navigated the Nile in ships, whose shapes are revealed by pottery models, but we cannot be sure that they sailed them. These Badarians were undoubtedly newcomers to Upper Egypt, who displaced the Tasians and perhaps other predecessors.

It is very difficult to identify the sexes of Badarian skulls, for the type is a delicate and feminine one, showing very little muscular development.[19] For this reason, the various investigators who have measured Badarian skulls have in no two cases agreed on their sexing, and the means vary accordingly, but with the most extreme division, the sex ratios are still unusually small, even for an Egyptian series.

The Badarian series is the earliest cranial sample of any numerical length which has yet been obtained from any part of the world. It is our first series, unified in time and place, which is ample enough to be studied by accurate statistical methods. These show that the series is not very variable, but its variability is no less than that of many modern populations. From this Morant concludes "In the last six thousand years there appears to have been little change in the variability of racial populations." [20]

The Badarian type represents a small branch of the Mediterranean racial group. The head is unusually high in comparison to the other dimensions, and the facial skeleton is in the absolute scale unusually small; the mandible is small, narrow, and light. Its mean male bicondylar diameter is the smallest known, while the bigonial diameter of 91.6 mm. is also extremely low.

Although the Badarian type is definitely related to that of the succeed-

[18] Derry, Douglas, **SAWV**, Jahrgang, 1932, #1–4, pp. 60–61.
[19] Morant, G. M., **Biometrika**, 1927, vol. 27, pp. 293–309.
[20] *Ibid.*, p. 306.

ing predynastic people, it is distinguished from it in a number of ways. The Badarian skulls are more prognathous than those of their successors, and have higher nasal indices. The nasal index is just on the line between mesorrhiny and chamaerrhiny. In fact, while the prognathism and nose form would suggest a negroid tendency, this cannot be established, since the hair form is definitely not negroid.

Morant shows that the Badarian cranial type is closely similar to that of some of the modern Christians of northern Ethiopia—who incidentally do not show negroid characteristics in the skull—and also to the crania of Dravidian-speaking peoples of southern India. One might add that living Somalis show a close approximation to this physical type in most respects, and the extremely narrow jaw in which the Badarians seem to reach a world extreme may be duplicated among both Somalis and the inhabitants of southern India. In Europe, the closest parallel to the Badarian type is found among modern Sardinians, but this is not as close as their relationships to other and later Egyptians.

On the basis of these racial comparisons, it seems reasonable to suggest that this Badarian physical type may have come from the south, near the headwaters of the Blue Nile. It may represent an early Hamitic racial strain, which persists despite some negroid admixture in Ethiopia and Somaliland to the present day.

The Badarian was succeeded in Upper Egypt by a sequence of cultures which may be treated under the collective term predynastic. In predynastic Egyptian times, the inhabitants of Lower Egypt, that is the region around Memphis and the modern Cairo, were physically and culturally distinct from those of Upper Egypt. The Egyptian writing was developed in Lower Egypt where reeds, birds, and other natural objects typical of that environment were incorporated into the syllabic and alphabetical signs. In predynastic times, there were two kingdoms of Lower and of Upper Egypt. The union of the two under Menes, around 3000 B.C., marks the beginning of the dynastic tradition. Predynastic times may be considered, therefore, to have occupied most of the preceding millennium.

In Upper Egypt, the early predynastic physical type is best represented by the series from Naqada.[21] (See Appendix I, col. 6.) The Naqada people, although they resembled the Badarians in many respects, yet differed from them sufficiently in others to assure us that these were two populations of separate though related origins. The Naqada people were fairly tall, with a mean stature of 167.5 cm. for eighty males. They were probably taller than the Badarians, although we have no definite data on Badarian stature. Both heads and faces were wider and larger than those of the Badarians; the noses were narrower, and there was less prognathism.

[21] Morant, G. M., **Biometrika,** vol. 17, 1925, pp. 1–52.

The less numerous Badarians were probably absorbed into the Naqada population, though there is no direct evidence to confirm this assumption.

In Lower Egypt lived another group of Mediterranean predynastic people who differed from the Upper Egyptians in certain noticeable ways. The heads were broader, the cranial indices higher, reaching a mean of 75, whereas the Upper Egyptian mean is nearly 72. The vault height is less, the face is no broader, but somewhat longer, and the nasal index is lower.

The two types from Upper and Lower Egypt represent the extremes of a purely native Egyptian population, but from the beginning of dynastic times, around 3000 B.C. until Ptolemaic times, the numerous series which give an excellent picture of the progress of racial continuity and change in Egypt show the interactions of these two types. The racial history of Egypt in the course of three thousand years was simply the gradual replacement of the Upper Egyptian type by that of Lower Egypt.[22] (See Appendix I, cols. 7, 8.) As one looks at the tables from century to century, one sees that the crania increased gradually in breadth from 131 to 139 mm., and the faces from 124 to 129 mm. Ancient Egypt must remain the most outstanding example yet known in the world of an important, naturally isolated region in which native racial types were permitted to develop their own way for several thousand years completely uninfluenced by foreign contacts.

Modern Copts, who probably represent the ancient Egyptian type more faithfully than the Moslem population, have diverged from the earlier types only in a reduction of the skull length from about 183 mm. to 177 mm. Therefore, evolutionary change in Egypt consisted entirely of a slight reduction of head length, and in places of a lengthening of the face, and a narrowing of the nose; but the change has not been notable. Changes in physical type in any part of Europe within the last five hundred years have been much greater than in Egypt during five thousand.

The wealth of contemporary illustrative material from Egyptian art sources may be divided into two classes, conventional representations and portraits. The former show a definite and well-recognized type; slender-bodied and wiry, with narrow hips and small hands and feet. The head and face are those of a smoothly contoured fine Mediterranean form.

The portraits, on the other hand, show two things in particular: that there was considerable individual variation in bodily build as in head and face form within the dolichocephalic and mesocephalic range, and that many of the officials, courtiers, and priests, representing the upper class of Egyptian society but not the royalty, looked strikingly like modern Europeans, especially long-headed ones. This is due perhaps to the fact that the Egyptian nose was not typically high rooted, like those of the

[22] Morant, *op. cit.*, 1925.

FACIAL TYPES IN DYNASTIC EGYPTIAN ART

FIG. 22

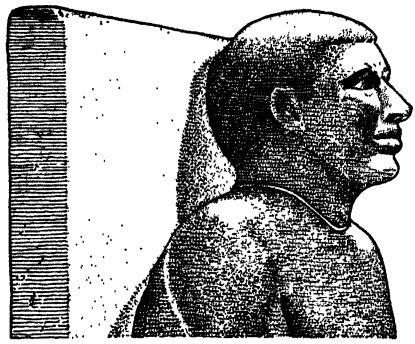


FIG. 23

FIG. 24

FIG. 25

Fig. 22, portrait head of a man, in green slate, in Ägyptisches Museum, Berlin; after anon., *The Art of Ancient Egypt*, Phaidon Press, Vienna, 1936, Plate 166. Fig. 23, portrait of Rahotep, Cairo Museum, after Schäfer, H., and Andrae, W., *Die Kunst des alten Orients*, 1925, p. 222. Fig. 24, plaster mask from workshop of the sculptor Thutmosis, Statlisches Museum, Berlin. Schäfer and Andrae, p. 339. Fig. 25, statue in possession of the Earl of Carnavon, Frontispiece, *Journal of Egyptian Archaeology*, vol. 7, 1917.

Mesopotamians as depicted in their art; and also, perhaps, because the portraiture, at least of the men, shows a greater angularity of line and form than do the conventional representations.

There may also have been some distinction of type in the royal families, for the rulers often have that extremely dolichocephalic head form, coupled with a sloping forehead and high nasal aquilinity, with highly excavated nostrils, seen so typically in the familiar mummy of Rameses III, as in the living emperor of Ethiopia, Hailie Selassie. This strain may well have been derived in most ancient times from the headwaters of the Nile.

The pigmentation of the Egyptians was usually a brunet white; in the conventional figures the men are represented as red, the women often as lighter, and even white. Although the hair is almost inevitably black or dark brown, and the eyes brown, Queen Hetep-Heres II, of the Fourth Dynasty, the daughter of Cheops, the builder of the great pyramid, is shown in the colored bas reliefs of her tomb to have been a definite blond. Her hair is painted a bright yellow stippled with fine red horizontal lines,[23] and her skin is white. This is the earliest known evidence of blondism in the world. Later Egyptian reliefs, however, frequently represented Libyans as blond,[24] and in early Egyptian times, the territory of the Libyans extended to the Delta itself. The Egyptian representation of foreigners is quite accurate; besides the Libyans, who have Nordic features as well as coloring, Asiatics, with prominent noses and curly hair, sea peoples from the Mediterranean, with lighter skins and a more pronounced facial relief than the Egyptians, are also shown, as well as negroes.

The blondism of Hetep-Heres II apparently belonged to the Delta and to the connections outside to east or west, rather than to Egypt proper, for it never recurred as an important or characteristic Egyptian trait. The Mediterranean pigmentation of the Egyptians has probably not greatly changed during the last five thousand years.

(5) NEOLITHIC NORTH AFRICA

In view of the importance of North Africa as one of the two main corridors of Neolithic diffusion into Europe, it is extremely disappointing that in it very few human remains of this cultural period have been found. A handful of skulls from Redeyef and Tebessa, near the border between Algeria and Tunisia, are the only surely Neolithic ones that have been described.[25] These are all of the small-statured, thin-boned, small-headed, dolicho- to low mesocephalic variety of Mediterranean already seen at Muge; smaller, on the whole, than most of the early Egyptians, and

[23] Reisner, G. A., **BBMF**, vol. 25, #151, October, 1927, pp. 64–79.

[24] Bates, O., *The Eastern Libyans.*

[25] Bertholon and Chantre, *Récherches anthropologiques dans la Berbérie Orientale*, pp. 237–242.

shorter-headed than the small Badarians. They cannot be derived directly from Egypt proper, nor from any known population of the Delta, if the few Merimdian skeletons already mentioned may be considered typical of that region. This small and geographically limited group is a local form of Mediterranean of the same variety which, at a presumably earlier date, had crossed the Straits into the Iberian Peninsula.

Other remains, found in caves in eastern Algeria,[26] are likewise small in absolute body size, having a mean stature of approximately 160 cm., but resemble the type of Téviec rather than that of Muge. They may be attenuated Afalou survivors, but cannot with certainty be ascribed to the Neolithic. Many, if not all, may be Mesolithic in date.[27]

The megalithic cultural complex, borne through the Mediterranean by sea in the Late Neolithic, and spreading northward past Gibraltar to the British Isles, France, and Scandinavia, reached the North African shores. But in this minor theater of megalithic activities the stone monuments, which do not occur east of Tunisia, may have been first erected in post-Neolithic times, since most of them contain objects of bronze, or even of iron. They were, in fact, occasionally used as burial vaults through Roman times, and right up until the arrival of the Moslems. Under these circumstances we cannot expect to find a purely megalithic race in the Tunisian and Algerian dolmens [28] and, to a certain extent, the material lives up to expectations. Although the cranial indices, in some thirty specimens, ranges from 67 to 84, the majority of the skulls are dolichocephalic, and some of them are extremely long, while most of them are leptorrhine, unlike the broader-nosed ordinary Mediterranean crania of the Neolithic. Furthermore, the stature of the dolmen people is tall, with a male mean of about 168 cm.[29] Unless these are the skeletons of Hamites or Arabs, we may infer that the megalith builders were not the small Mediterraneans proper of Mesolithic tradition, but a new ethnic element which we shall be able to study more profitably when we find it in greater numbers farther to the north.

(6) THE NEOLITHIC IN SPAIN AND PORTUGAL

It is not easy, from a distance, to collect and review the evidence for the Neolithic population of the Iberian Peninsula. I have been able to assemble data on some fifty crania from Spain, and nine from Portugal, which seem, with reasonable certainty, to be of Neolithic age.[30]

[26] *Ibid.*, pp. 240–242.

[27] Boule, M., Verneau, R., Vallois, H., **AIPH,** Mem. 13, p. 190.

[28] There are very few in Morocco, and nothing is known of their skeletal contents.

[29] Bertholon and Chantre, *op. cit.*, pp. 243–249.

[30] Scheidt, W., in his *Die Rassen der jungeren Steinzeit in N. W. Europa,* pp. 87–92, accepted but 38, besides the 68 early Bronze Age crania from el Argar. Czortkower, S., the author of another compilation (**PAn,** vol. 8, 1934, pp. 45–52), used 118 from Spain,

The Portuguese specimens, all from the Tagus Valley, can all be classified as Mediterranean. They include, however, not only the small Muge type, but others with larger skulls and taller stature, as high as 168 cm. in the case of one male.[31]

The Spanish material is best represented by two series, the first from the cave of La Solana at Angostura, Segovia [32] (see Appendix I, col. 9), and the second from the cave of Ticuso at Sepulveda, in the same province.[33] Both of these series were originally called Magdalenian, but the presence of pottery and polished celts in the Solana cave, and of trephination at Ticuso, leave little doubt that both are really Neolithic.

The Solana series, which includes ten males and four females, represents a relatively large Mediterranean type, which may be nearly duplicated in the Egyptian series from the royal tombs at Abydos [34] and would also fit metrically into a Mesopotamian Eurafrican type group. Morphologically, the crania are relatively heavy, with moderately large supraorbitals.

The second series, that of Ticuso (see Appendix I, col. 10), includes fourteen male and seven female crania. These are somewhat smaller and more delicately formed than the Solana series, and resemble metrically the Naqada predynastic skulls from Upper Egypt. Smaller series and single skulls from other parts of Spain usually fall into this same category.

The human remains which represent the Neolithic period in Portugal and Spain, therefore, incomplete as they are, corroborate the evidence of archaeology. The Iberian Peninsula was a corridor of movements into western Europe from North Africa, and two types, at least, made use of this passageway—a small variety of Mediterranean, somewhat larger than the Mesolithic people of Muge, but basically the same, and identical with the people who moved into the upper valley of the Nile in predynastic times; and a somewhat larger, heavier sub-division of the same race, similar to Neolithic man in western Asia, and perhaps to the early farmers of the Egyptian Delta. To what extent these two types included local Mesolithic survivors it is impossible to tell.

which probably include el Argar. When these are subtracted his list attains exactly the same size as mine.

[31] Barros e Cunha, J.-G. D., **ACIA,** 3me Session, Amsterdam, 1927, pp. 358–360.
Hervé, G., **REAP,** vol. 9, 1899, pp. 265–280.
Mendes-Correa, A., **BAC,** vol. 3, 1925, pp. 117–146.
Hervé states (p. 274) that the series includes a few brachycephals, but the published data do not support this.

[32] Barras de Aragon, F. de las, **AMSE,** vol. 12, 1933, Cuad. 1, pp. 90–123; Verneau, **RDAP,** 1886, ser. 3, vol. 1, pp. 10–24.

[33] Hoyos Sainz, L., **CRCA,** 14me Sess., Geneva, 1912, vol. 2, pp. 399–408; Barras de Aragon, *ibid.*

[34] Morant, *op. cit.*, 1925.

(7) THE EASTERN SOURCE AREAS: SOUTH, CENTRAL, AND NORTH

North of the Pyrenees, the Neolithic population of Europe was immediately derived not only from Africa, but also from the east. In order to understand the racial complications of trans-Pyrenean Europe in the Neolithic, we must converge from a different quarter. The eastern source areas, and their possible routes into Europe, may be divided into three: (a) Crete and the Aegean Islands, thence by sea to Greece, and to Italy, and from Greece, northward by land into Macedonia. (b) From Anatolia over the Bosporus into the Balkans, and thence up the Vardar and down the Morava into the Danube above the Iron Gates. (c) Around the northern shore of the Black Sea, and perhaps of the Caspian Sea as well, then the steppes of southern Russia into the plains which reach through Poland to Germany, and into the Danube Valley.

(a) Our knowledge of the physical type in Greece during the Neolithic is confined to one small, narrow, female skull of Mediterranean type, from Arcadia,[35] which, as we shall soon see, is perfectly consistent with the racial picture farther north, although it is not very likely [36] that racial movements passed northward from this quarter at that time. Crete, whose civilization was rooted in the Neolithic, is unknown racially until the Bronze Age.

The Neolithic inhabitants of Italy probably came from the east in large measure by sea, although some may have entered from other directions, as from North Africa by way of Malta and Sicily, around the Tyrrhenian Sea from Catalonia, and down over the Alps from the north.

It is also very likely that Mesolithic types, containing an earlier Palaeolithic increment, survived in Italy into the Neolithic, for, until the arrival of metal, Italy and its islands formed an area of relative isolation from the main racial and cultural currents which affected Europe as a whole.

Although Aeneolithic or Copper Age skeletons from Italy are abundant, those dating from Neolithic time are rare.[37] All that have been found [38] (51) are long-headed, and of Mediterranean type. Three skulls from the Ligurian cave of Arena Candide which are very large and of great length, may represent, at least in part, an Upper Palaeolithic survival of Early Aurignacian type, or an invasion of the tall Mediterranean type usually identified with the megalith-builders. It will be more profitable, however, to defer the study of racial types in early Italy and her islands until our discussion of the Copper and Bronze Age population, when we shall have something more definite and extensive with which to work.

[35] Fürst, Carl M., **LUA**, NF. Avd 2, Bd. 28, #13, 1932.
[36] Fewkes, V. J., Goldman, H., Ehrich, R. W., **BASP**, #9, 1933, p. 18.
[37] Sergi, G., *Europa*, pp. 270–289.
[38] With the exception of one microcephalic skull, *op. cit.*, p. 279.

(b) The second eastern source area from which Neolithic invaders may have entered Europe is that of the Anatolian plateau—to what extent the Danubian peasants were derived from these highlands is a matter of dispute among archaeologists which we shall do well not to enter. At any rate, no Neolithic skeletal remains have yet been found there, and the metal period sites which have been studied are later than those in Mesopotamia. Farther east, at a site called Zizernakaberd in Armenia, the brain case of a tall man (172 cm.) with apparently Upper Palaeolithic affinities, resembling Murzak Koba, may have been buried in the earliest Neolithic time.[39] This one specimen from Armenia is small evidence, and we still do not know what kind of people lived in Anatolia at the time when the first farmers pioneered up the valley of the Danube.

(c) The third eastern source area, and perhaps the most important of the three in the total peopling of Europe in the Neolithic and later, is the grassy plain extending from Poland across Ukraine and Bessarabia, north of the Black Sea and Caucasus, across to the Caspian, and beyond into Turkestan. Here the evidence of Neolithic man is considerably better than in the other two.

On the eastern side of the Caspian, near the modern border between Russian territory and Iran, are the three famous Kurgans, or mounds, of Anau. The earliest cultural horizon found in this site, Anau I of the north mound, probably dates from 3500 to 3000 B.C., on a conservative estimate. This level, which is largely but not purely Neolithic, contained a number of human skeletons,[40] most of which were those of children.

All of the children were dolichocephalic, and apparently of Mediterranean type. One adult female, found with them, was the same. She was mesocephalic, with a cranial index of 76, and her skull shows a minimum of bony relief. The forehead projects forward, the glabella is almost absent, the nasal root high, and the nasal profile apparently straight; the orbits are mesoconch, and the facial bones delicate.

Another adult, in this case a male, is represented by a mandible and certain facial bones below nasion. Again a Mediterranean type is indicated, orthognathous, with a strong lower jaw, and a small nose which was moderately leptorrhine. This specimen, the female, and the children, although hardly a series, are sufficient to show us that this southwestern corner of Turkestan was inhabited by agricultural, animal-breeding,

[39] Vishnevsky, B. N., **MAGW,** vol. 64, 1934, pp. 102–111.

[40] Mollison, T., "Some Human Remains Found in the North Kurgan, Anau," in Pumpelly, R., *Explorations in Turkestan,* vol. 2, pp. 449–463.

Sergi, G., "Description of Some Skulls from the North Kurgan, Anau," *ibid.,* pp. 445–448; **ASRA,** #13, 1917, pp. 305–321.

Warner, Langdon, "Report on Skeletons Excavated at Anau," in Pumpelly, R., *op. cit.,* p. 484.

pottery-making people of general Mediterranean type in the second half of the fourth millennium B.C., as early as the predynastic period in Mesopotamia.

Long bones from the following level in the North Kurgan show variations in stature—with two males at 170 and 161 cm., respectively, and a female at 149 cm.

A post-Neolithic skull from the South Kurgan, probably of the third millennium, is, like the others, dolichocephalic. It has a low, sharply curved forehead, no browridges, small zygomatic arches, and apparently considerable prognathism; [41] but an exact racial diagnosis of it cannot be made.

Returning to the Neolithic material, we may be sure that it all belongs to some branch of the Mediterranean race, but, with the present evidence, which does not contain a single complete adult male specimen, we cannot hope to distinguish the skeletal sub-variety.

In the grasslands of European Russia, south of the forest belt, a racial continuity with Anau extends westward into the Ukraine. One of the earliest sites which show this connection is located at Mariupol near the mouth of the Kalmins River on the shore of the Sea of Azov.[42] Here, an unstated number of skeletons, lying in rows and covered with red ochre, was found in association with apparently Early Neolithic implements, and a quantity of bone, shell, and tusk objects. Although the typology of the artefacts is early, we do not know the date, but the absence of pottery would presumably argue against a late assignment.

No measurements of these skeletons have been published, but the description is sufficient to show that a Mediterranean type, perhaps similar to that found at Anau, is probably involved. The stature was "slightly above the medium height of today," [43] which would place it in the upper 160's; the bones of the extremities are elongated, the hands narrow and long. The skulls are small, and in all cases dolicho- or mesocephalic.

Neolithic crania from southwestern Russia and the adjacent segment of Poland are not numerous, but are clearly differentiated racially.[44] They belong to two types; a high-vaulted, moderately broad-nosed dolicho- to mesocephal, associated with short stature, 160 cm. or less, in the males. This type, which carries the Anau form to the west, is the most numerous,

[41] From a poorly oriented photograph given Sergi by Pumpelly and published by the former, without measurements. Sergi, G., **ASRA,** vol. 13, 1907, pp. 305–321.

[42] Makarenko, N., **ESA,** vol. 9, 1934, pp. 135–153.

[43] *Ibid.*, p. 140.

[44] Bogdanov, A. P., **AAM,** vol. 3, 1879, part 1, p. 305.
Czarnowski, S. J., **Swiatowit,** vol. 3, 1901, pp. 75–84.
Levit'kyj, I., **AntrM,** vol. 2, 1928, pp. 192–222; **ZVAK,** vol. 1, 1930, pp. 159–178.
Saller, K., **AAnz,** vol. 2, 1925, pp. 26–46.
Zabrowski, S., **BMSA,** ser. 5, vol. 2, 1901, pp. 640–666.

and is centered in the Volhyn district of the Ukraine. With it, in the Late Neolithic Fatjanovo culture, are associated a few brachycephals which, except for head form, differ little from the rest. This "Danubian" type is not basically different from some of the Lower Egyptian and Delta groups.

The second type, commonest in Late Neolithic cemeteries of the Kiev government, is of the tall (stature = 171–172 cm.), hyperdolichocephalic variety, usually leptorrhine and high-vaulted, which we have called "Corded." Crania of this variety are actually few in number, and probably Late Neolithic in date. Metrically, they resemble the earliest Sumerian skulls at el 'Ubaid.

Sergi, on a visit to Moscow some thirty years ago, measured over seventy male "Kurgan" crania from southern Russia, dating from all periods from the Neolithic to the pre-Christian Iron Age. These, selected as "Mediterraneans," [45] conform to the two types mentioned above. The main group, the smaller variety, fits our "Danubian" type, the larger, the "Corded." In general, the metrical deviation of the total group from Mesopotamian figures is not great.

The result of this south Russian inquiry leads to several cumulative if tentative conclusions:

(1) During the Neolithic, all known avenues of approach to Europe, from Gibraltar to the southern limit of the Russian forest, show only variants of Mediterranean or Galley Hill man. The Neolithic culture with its food-producing economy, and the Mediterranean race, are, as Sergi said, inseparably linked.

(2) The special "Mediterranean" form, which had apparently brought agriculture to the countries north of the Iranian plateau and Black Sea, was not unlike others found in more southerly regions in which Old World agriculture is supposed to have originated.

(3) The tall, hyperdolichocephalic high-vaulted variant of the basic Galley Hill stock, elsewhere to appear as the Corded people, was present, at least by the Late Neolithic, in southern Russia.

(8) THE DANUBIAN CULTURE BEARERS

One of the most striking events of the Neolithic period in Europe was the gradual migration of farmers up the Danube Valley into central Europe. These new settlers stayed fairly close to the banks of the river and its tributaries, farming on patches of loess where the land would not need to be cleared by the axe. Southern Hungary, Moravia, Bohemia, and Silesia were areas which they found especially favorable, and in which they settled in greatest numbers. As they moved to the west, they finally

[45] Sergi, G., *Europa*, pp. 309–316. In Sergi's own words, Eurafrican. This term has since taken on a narrower meaning in the hands of Mesopotamian archaeologists.

reached southern Bavaria, Baden, and the north of France, especially the Paris basin. From southern Germany onward, they encountered the descendants of the Neolithic people who had entered by way of Gibraltar.

The river valleys which the Danubians occupied must have been relatively free of people; Mesolithic remains in the eastern and middle Danube Valley are very scarce, if not entirely absent.[46] We may therefore expect the remains of the Danubian immigrants to exhibit, without particular alteration, the physical characteristics of the population or populations from which they originated.

Danubian chronology is based on pottery types, particularly on techniques of decoration; the earliest Danubian, Period I, is typified by incised pottery with banded decoration, while the second and third periods mark the common use of painted pottery. The agriculture of the Danubians was a hoe-culture, for the characteristic tool is a hoe blade of flint, called a "shoe-last celt." Their domestic animals included the ox, sheep, and pig.

It is one of the problems which face the archaeologist in the future to discover the point of origin of Danubian pottery. Incised black ware, of the banded variety, undoubtedly came from somewhere to the east; from the country north of the Black Sea, or from Anatolia, whence it may have been influenced by the same source which produced the Merimdian of the Egyptian Delta. In this case, the two movements, the Danubian and that which passed over Gibraltar, may have come from a single original source in western Asia, and have moved into Europe from two different directions, converging in Switzerland, southern Germany, and France.

The painted pottery, on the other hand, shows definite Asiatic similarities; there was painted pottery in Iraq in the earliest known cultures; Anatolia contains some varieties of it; the Iranian plateau is said to be full of it; there is painted pottery at Anau in Turkestan; and painted pottery penetrated early into Kansu in China. Despite these occurrences, we do not yet know by which route or routes it entered Europe from the east. It may have come across the Bosporus, around the Black Sea, or from both quarters. Again, it may have travelled, farther east, either north or south of the Caspian.

The physical evidence at hand will hardly settle the problem of Danubian origins, although it will, in a fragmentary manner, dispel a number of unfounded hypotheses. In the material used in the present survey, seventeen male crania associated with banded pottery,[47] and seven associated

[46] Fewkes, V. J., Goldman, H., Ehrich, R. W., **BASP**, #9, 1933, pp. 17–32. Also, personal communication of Dr. V. J. Fewkes.

[47] Bayer, J., **MAGW**, vol. 51, 1921, pp. 46–47.
Lebzelter, V., **MAGW**, vol. 66, 1936, pp. 14–15; *ibid.*, "Sitzungberichte," p. 16.
Reche, O., **AFA**, vol. 35, 1908, pp. 232–237.

with painted,[48] are all that can without doubt be attributed to the Danubian Neolithic. These may be supplemented by a smaller female series.

The two series, Banded and Painted, are so close to each other anthropometrically that they may readily be pooled (see Appendix I, col. 11). Their type is a familiar one—a small Mediterranean, with cephalic indices ranging from 68 to 81, and a mean of 73.6. The mean cranial length is 185.5 mm., but individually they go as high as 196 mm. The vault height, 139 mm. is elevated in comparison to the other dimensions. The faces are short (116 mm.), and moderately narrow (130 mm.); both foreheads and jaws (minimum frontal 96 mm., bigonial 94 mm.) are also of moderate breadth. The orbits are low, with an orbital index mean of 80, the noses chamaerrhine, with a nasal index mean of 55. The highest orbitted skull has an orbital index of 91, the most leptorrhine a nasal index of 45.

Although this Danubian group is reasonably homogeneous, even with the small numbers available it is seen to include more than one type in the strictest sense. For example, the stature is low; Reche found a mean of 153 cm. for eight Banded male skeletons from Jordansmühl, and in this small series four mesocephalic crania are associated with higher statures than are the purely dolichocephalic ones. Some of the skulls with higher orbits and longer vaults differ again from the majority. On the whole, however, the group is definitely dolicho- to mesocephalic, and definitely Mediterranean. As far as the criteria studied may be invoked, this series is very similar to Sergi's Kurgan group from southern Russia, and may be considered to contain the same racial elements, although the Russian material as a whole is less homogeneous.

If we carry the comparison further, we find, again, strong resemblances in the Spanish Neolithic, and with all of the smaller Mediterranean groups. The Danubians undoubtedly represent another branch of the same racial group which entered Europe from North Africa through the southwestern avenue. Where they came from immediately before their arrival in Europe, however, it is impossible at the moment to tell. The Russian evidence, including that from Mariupol and Anau, leans heavily in favor of a trans-Euxine origin, but at the same time they might have come from Anatolia, from which we have as yet no Neolithic skeletal evidence. It is again possible that related elements from more than one geographical source made up the Danubian migrations.

We do not know what language the Danubians spoke, nor what was

[48] Doniči, A., **ACAP,** 1931, pp. 114–115.
Lebzelter, V., **WPZ,** vol. 15, 1928, pp. 35–41.
Nestor, I., **BRGK,** #119, 1933, p. 37.
Schürer von Waldheim, Hella, **MAGW,** vols. 48–49, 1919, pp. 247–263.
Virchow, R., **ZFE,** vol. 22, 1890, p. 97.
Zimmerman, G., **AJKS,** vol. 10, 1935, pp. 227–236.

the coloring of their skin, hair, and eyes. But we may surmise from the small evidence which has been assembled that the successive waves represented did not come from racially different parent groups.

Although we cannot, from this evidence, state what racial elements were lacking in the Danubian countries during the Neolithic, we know that the culture bearers from the east belonged to, or included members of, the wider Mediterranean stock, which seems everywhere to be associated with the earliest food production; and the most important element seems to have been a small, light boned, rather infantile Mediterranean.

(9) THE CORDED OR BATTLE-AXE PEOPLE

The latter part of the Neolithic period in most of north central Europe is marked by the appearance of an enigmatical group of people, who decorated their pottery, while still wet, with cord impressions, and who also placed in their graves perforated stone battle-axes suspiciously like those of the Fatjenovo culture in southern Russia, and others in the Caucasus. These axes, again, have copper parallels in Sumeria. The limits of the country overrun by the Corded people are the Vosges on the west, the Urals on the east, the Baltic on the north, and the Dinaric Alps on the south.[49] Although these invaders were partly agricultural, their graves contain weapons rather than hoes, and, in a few cases, bones of horses, probably of a domestic variety.

Their rôle in the economic and political picture of Neolithic Europe remains still in doubt. Although they were equipped for warfare, they did not fight for the love of battle alone. The location of their burying grounds near the sources of natural wealth, such as amber, salt, and later of tin, shows that they were interested in easily traded commodities of small bulk but high value. They may have been Neolithic racketeers extorting their share from the drones, or overlords among peasants, or merely industrious and well-armed peddlers. Whatever their calling, whether peaceful or otherwise, they were destined to influence the later cultures of Europe in considerable degree.

The most typical aggregation of Corded skulls comes from Silesia and Bohemia, whence a series of twenty-nine males may be assembled.[50] (See Appendix I, col. 12.) These belong to a very definite, very distinct physical type. The length of the vault is great, well over 190 mm. in most instances; its breadth is slight, yielding the low mean cranial index of 71; and the height is great, considerably exceeding the breadth. Combined with this

[49] Childe, V. G., *The Danube in Prehistory*, pp. 145–160.
[50] Reche, O., **AFA**, vol. 35, 1908, pp. 232–237.
Stocký, A., **AnthPr**, vol. 7, 1929, pp. 65–78.

exaggeratedly long, narrow, and high vault form is usually found a high, relatively steep forehead; stronger browridges and muscular markings than are usual with the Mediterranean types familiar to us in Egypt, Spain, and the Danube; while the face form includes compressed zygomata, low orbits, and a leptorrhine nose. The face heights are probably great, and the mandible is deep and strongly marked, although usually narrow. Unfortunately, in this series, these facial descriptions are much less certain than those of the vault, for few of the crania retain their facial segments. The long bones are heavier and more rugged than those of the smaller Mediterranean varieties, but the stature, ranging between 157 and 170 cm. in ten male examples, reaches the unimpressive mean of 164 cm. In other Corded series, as we shall see later, it is almost always tall.

The Corded crania are larger than any from Egypt, and are metrically very similar to the Elmenteita skulls from East Africa—the two groups could be combined without loss of homogeneity. In Mesopotamia, they may be favorably compared with the three early dynastic skulls from Ur, although they are higher vaulted than the other early groups.

There has been much discussion over the origin of the Corded people, and many cradle-areas have been proposed. Childe, despite several objections which he himself raises, prefers to derive them from southern Russia, where the typical cultural elements of the Corded people are found mixed with other factors. The so-called boat-axe, the typical battle-axe form which they used, has relatives all the way to the Caucasus and beyond. And the horse, their use of which in the domestic form is not fully confirmed, since the grave examples might conceivably have been wild ones, was first tamed in Asia or in southern Russia.

On the basis of the physical evidence as well, it is likely that the Corded people came from somewhere north or east of the Black Sea. The fully Neolithic crania from southern Russia which we have just studied include such a type, also seen in the midst of Sergi's Kurgan aggregation. Until better evidence is produced from elsewhere, we are entitled to consider southern Russia the most likely way station from which the Corded people moved westward.

There is one cautionary remark which must be made here, and that is: there is so far no justifiable reason for assuming that the Corded people were Nordics. Their cranial type, as we know it, does approach one or more of the forms which we know, in later times, to have been associated with blondism; but it also approaches those of the Iranian plateau and of Ur, which were probably brunet. Let us withhold judgment, therefore, upon Corded soft parts and pigmentation, and view these remains in the more scientific but less lively light of a skeletal type.

This Corded skeletal type is familiar also in Poland, where it is found

in the graves of its associated culture; but that country also contains the more usual Danubian type, associated with a Neolithic agricultural economy, and a certain number of brachycephalic and other crania, which have northern affiliations, and which will therefore be dealt with later.[51]

In southern and western Germany remains of the Corded people are again found, and in comparative abundance. In Saxony and Thuringia they flourished especially, and apparently were more stable here than farther east. Out of ten crania which belong to the Saxo-Thuringian Corded culture,[52] four of the seven which can be measured are mesocephalic, and only three dolichocephalic. In the eastern Corded group, the highest index was 75. The three dolichocephals seem to have belonged to the usual type.

The statures of two of them were both 168 cm. The rest of the crania, as far as one can tell, are normal Neolithic Mediterranean examples, which might have had either a Danubian or a North African derivation, or both. The Corded people in the west and south of Germany had settled down, and had combined with Neolithic farmers.

Before we leave this section, let us move still farther west to Baden, to the Early Neolithic cemetery of Altenburg.[53] Here, in the center of one of the most brachycephalic regions of Europe today, were buried four male skeletons, the crania of which ranged from 65 to 71 in cranial indices, and two female skulls of 77. The long bones are small, the statures short; the skulls are delicate in appearance and purely Mediterranean—but remarkable for the narrow vault form of the males. Six other Neolithic male crania, from Wörms, are similar.[54] This evidence, while not complete, at least shows that the Corded people, in southern and southwestern Germany, were preceded by an agricultural population of the smaller Mediterranean variety, upon which they superimposed themselves.

(10) THE NEOLITHIC IN THE BRITISH ISLES

The next move in this geographical game is back to the extreme west again, and to Britain. The Early Neolithic culture of the British Isles was a peripheral echo of the movements which influenced the rest of western

[51] Lencewicz, Stanislaw, **Swiatowit,** vol. 10, 1912, pp. 53–64.
Rosinski, B., **WArc,** vol. 9, 1924–25, pp. 29–50; **ACIA,** 2me Session, Prague, 1929, pp. 164–174.
Westlawawa, Eleanora, **PAn,** vol. 9, 1935, pp. 80–84, French résumé, pp. 142–143.
[52] Götze, W., **JVST,** vol. 24, 1936, pp. 91–100.
Heberer, G., **JVST,** vol. 24, 1936, pp. 82–90.
Strauch, K., **MannusZ.,** vol. 7, 1915, pp. 249–262.
[53] Mühlmann, Wm. E., **ZFMA,** vol. 28, 1930, pp. 244–255.
[54] Virchow, R., **ZFE,** vol. 29, 1897, p. 464.

Europe. The so-called Windmill Hill culture, closely allied to the Michelsburg expression in southern Germany, may have been originally of either North African or Danubian inspiration, or a blend of both. Childe, seeing Merimdian similarities in the pottery, suggests but does not insist on the former. At any rate, we have no valid evidence in Britain itself to indicate the physical type of the people who brought it.[55]

The bulk of the Neolithic population of the British Isles seems to have come by sea,[56] with the Megalithic invasions which also passed on to Denmark and southern Sweden. In many parts of Scotland and in Ireland, the Megalithic people may well have been the first bringers of the Neolithic economy. In England, it was their custom to make primary interments under long barrows of earth, unchambered in Yorkshire and Derbyshire, chambered in the counties farther south.

The cranial remains of Long Barrow men, as the occupants of these monuments are called, are abundant.[57] (See Appendix I, col. 13.) Although over 160 skulls represent this group, the geographical distribution is far from even. Wiltshire, Staffordshire, and Gloucestershire account for 120; fourteen only are from Scotland, and one from Ireland. The remaining thirty come from a few counties of England. Wales is unrepresented as is most of Scotland; the few crania found in the latter country were all buried close to the sea. The Long Barrow people, who had come by water, selected open, unforested country to live in. A large part of the land area in the British Isles was, therefore, either uninhabited or open to the wanderings of earlier human occupants.

The Long Barrow population formed a distinct, homogeneous type; one different from any which, to our knowledge, had previously inhabited the British Isles since the days of Galley Hill; and one which cannot be duplicated, except as an element in a mixed population, anywhere on the western European continent. One is, therefore, led to conclude that the Megalithic cult was not merely a complex of burial rites which dif-

[55] The so-called river-bed skulls, dredged from the bottom of the Thames, are those of low-vaulted Mediterraneans. These may include some examples from the Early Neolithic, but the evidence is inconclusive. (Garson, J. G., **JRAI,** vol. 20, 1890, pp. 20–25.) Three skulls from stone cists at La Motte, Jersey are similar. (Marett, R. R., **Archaeologia,** vol. 63, 1911–12, pp. 203–230. Keith, Sir A., *Antiquity of Man,* vol. 1, pp. 52–65.)

[56] Childe, who read Chapters II to VII in manuscript before revision, comments at this point: "I find it hard to believe that the bulk of the British population came by sea. The Windmill Hill culture is predominant in the megalithic tombs, but arose earlier." While Childe is undoubtedly correct as to the importance of the Windmill Hill people culturally, there is little evidence of them in a physical sense. This apparent contradiction cannot be explained on the basis of present data. The fact that small Mediterraneans do appear in the living British population (see Chapter X) indicates that Childe's observation may be well founded.

[57] Morant, G. M., **Biometrika,** vol. 18, 1926, pp. 56–98.

fused without visible carriers; and also that the bearers of this complex avoided mixture by coming by sea.

In stature and bodily build, the Megalithic people belong to a large variety of Mediterranean. The stature for a large number of males [58] from England ranges about a mean of 167 or 168 cm.; which is not contraverted by the meager evidence from Scotland and Ireland. Four male skeletons from a single burial in Kent [59] may represent, more nearly than most, the Windmill Hill group; they are somewhat shorter than the rest.

The Long Barrow skulls are large for a Mediterranean sub-race, but not as large as those of the Upper Palaeolithic peoples. They are particularly long, moderately narrow, and of medium height. Unlike that of the Corded skulls, the height is less than the breadth. In most instances, the occiput projects far to the rear; the parietals are parallel; the forehead is moderately sloping, and, in contrast to the restricted skull width, very straight and broad.

The face is of medium length and of moderate width; the orbits are of medium dimensions, and in many instances slope downward and outward, as if the confines of the face were too narrow for them. The nasion depression is of medium depth, under browridges of medium development; and the straight-profiled nose is leptorrhine. In its totality, the Long Barrow type is both extreme and striking.

In looking for related populations of equal age, we may eliminate at once the smaller, less dolichocephalic branches of the Mediterranean race proper, including the Danubian. A few individual crania in Neolithic Spain and Italy would qualify, but none of the series from these countries. The standard Egyptian crania, as groups, are all too small, as is the single lady from Greece. In one particular feature, the nasal index, the Long Barrow people resemble the Egyptians more than most of the more northerly Mediterraneans, for the Long Barrow crania are leptorrhine.

In their extreme dolichocephaly, the Long Barrow skulls resemble the Corded group, but the comparison does not hold for all features—the Long Barrow skulls are slightly longer, considerably broader, and much wider of forehead, than the Corded specimens, and, of course, the vault of the Long Barrow skulls is much lower.[60] As far as one can tell, the

[58] Calculated by the Pearson formulae on femora from several series, including some eighty-six individuals from England, of which many may be duplicates; three from Scotland, and one from Ireland. Sources: *Crania Britannica;* Thurman, J.; Garson, J. G.; Mortimer, J. R.; Keith and Bennett; Edwards, A. J. H., and Low, A.; Laing, S., and Huxley, T. H.; and Bryce.

[59] Keith, Sir A., and Bennett, **JRAI,** vol. 43, 1910, pp. 86–100.

[60] In this I am relying on Morant's mean of 135.5 mm. for 25 male crania. Schuster (1905) gives 137.8 mm. for 12; Garrison, 135.0 mm. for four from Howe Hill Barrow, Yorkshire. On the other hand, 45 male crania of Thurman (1867) when seriated = 143 mm., 59 from the *Crania Britannica* and Thurman = 142.1 mm.

orbits in the two series are much the same, while in regard to the faces, there is not enough evidence in the Corded group for a valid comparison.

A true and valid similarity, however, may be found between the English Long Barrow series and the early skulls from al 'Ubaid in Sumeria, which, whether belonging to the fourth or third millennium B.C., are in either case older than their British counterparts. The only difference, which prevents identity, is that the Mesopotamian faces and noses are somewhat longer.

The current idea that the Long Barrow people were directly derived from the Upper Palaeolithic inhabitants of Britain is clearly erroneous. The Long Barrow skulls are definitely smaller, shorter, and narrower than those of the Upper Palaeolithic group, but of equal or greater height; they have the same forehead breadth, the same upper face height, but a smaller jaw, a much narrower face, and narrower orbits. There is probably a genetic linkage, over a long period of time, between the Long Barrow or Megalithic type and an early Galley Hill or Combe Capelle variety of European man, but the continuity could not, for historical reasons, have taken place in England.

The few crania from the Scottish seashores belong to the standard Long Barrow type, and the same may be said of the one surely Neolithic specimen from Ireland—the male vault from Stoneyisland, Portumna, County Galway.[61] The male skull from Ringabella, County Cork,[62] which is perhaps also Neolithic, is likewise of Megalithic race, while the disputed Kilgreany specimen, whatever its age, is, although low vaulted, also basically of a Galley Hill Mediterranean type.[63] However, the large mandible of the latter, and its low vault, make it atypical, so that it, like two skulls from Phoenix Park, Dublin,[64] which may be Neolithic or Early Bronze Age, is not wholly characteristic of the Long Barrow race, and may derive its peculiarities from either a Mesolithic or an Early Bronze Age source. We must repeat, in view of these aberrances, that the only surely Neolithic skull in Ireland is of Long Barrow race.

The Megalithic Long Barrow people must have come by sea, and they probably came from somewhere in the Mediterranean. They did not

[61] Martin, C. P., **JSAI**, vol. 64, June, 1934, pp. 87–89.
Movius, H. L., Jr., *op. cit.*, vol. 65, Dec., 1935, p. 282. For dating by palaeobotany, see Shea, S., **JGAS**, vol. 15, 1931, pp. 73 ff.
White, Miss J. M., **INF**, vol. 3, 1934, pp. 270–274.
[62] Martin, C. P., in Ó Ríordáin, S. P., **JSAI**, vol. 64, June, 1934, pp. 86–87.
[63] Fawcett, E., **PBSS** for 1928, vol. 3, #3, pp. 126–133.
Martin, C. P., as above.
Movius, H. L., Jr., as above.
Tratman, E. K., *ibid.*, pp. 134-136.
[64] Haddon, A. C., **PRIA**, vols. 3, 4, 1896–98, pp. 570–585. Also, *Crania Britannica*, skulls 22 A and B.

find the British Isles uninhabited, and their homogeneity, in a few restricted localities, cannot mean that they caused the extinction of earlier peoples. Nor did they, when still later invasions of another physical complex reached the British Isles, become extinct.[65] The mountains of Wales, the hills of Cornwall and Devon, and almost the whole of Ireland, remain a blank in our early skeletal map of the British Isles.

(11) WESTERN EUROPE AND THE ALPINE RACE

By this time we have studied all of the approaches by which Neolithic food-producers invaded Europe, and have seen that in all known cases these immigrants belonged to some branch of the Galley Hill stock or wider Mediterranean race. We now come to the portions of Europe in which the Mesolithic cultural tradition had a strong survival—as a blend into the Neolithic economy, or as an absolute continuation. These portions may be divided into three general groupings: (1) Western Europe—that is, Switzerland, France, and Belgium; (2) Scandinavia, northern Germany, and the eastern shores of the Baltic; (3) The forest belt which stretches across northern Russia into Siberia. It is with the first of these that we are immediately concerned.

Commencing with Switzerland, we find, in the so-called Lake Dwelling culture of the Neolithic, a blending of the old with the new. The early Lake Dwelling culture of western Switzerland, centered about Lake Neufchatel, consists of the grafting of North African Neolithic agriculture upon a local Mesolithic base, while that of eastern Switzerland represents the same phenomenon to which a Danubian element may later have been added. Toward the end of the Neolithic period, just before the introduction of metal, the Corded people invaded Switzerland from the north, and at this time local, sectional differences were to some extent ironed out.[66]

Under these circumstances, we may expect to find, in all Swiss Lake Dwelling skeletal collections from the Early and Middle Neolithic, examples of the small Mediterranean race, representing the bringers of agriculture and animal husbandry to the hunting and fowling communities of the lake shores; as well as survivors of the previous population, whatever, in a racial sense, they may have been.

Unfortunately, the archaeologists have yet to discover the cemeteries in which the Lake Dwellers buried their dead; what few remains have been found seem to have been for the most part those of persons who died by accident, and especially of children. Schlaginhaufen states that seventy-

[65] As suggested by Hooke, Beatrix, G. E., and Morant, G. M., in their article: **Biometrika,** vol. 18, 1926, pp. 99–104.

[66] Childe, *The Danube in Prehistory,* p. 186.

three Lake Dwelling skulls, suitable for the study of the cranial index, are known to exist, but few of these have been made available to the profession through publication. Schlaginhaufen could find but nine adult crania with measurable faces.[67]

His conclusion is that in the earliest phase of the Swiss Neolithic, brachycephals predominate; in the late stages, round and long skull forms are about equal in number, with few intermediate forms; later, the two blend, and there is a reinforcement of dolichocephals at the beginning of the metal period. The brachycephals of the Early Neolithic were short statured, low faced, low orbitted, and broad nosed; later, their face form became longer and narrower, producing, by the end of the Neolithic, disharmonic forms. The original combination of round heads with low faces and orbits had been upset by mixture with the invading Mediterraneans.

One must remember that these conclusions on changes in linkage between head form and face form are presumably based on no more than nine specimens. Five of these may be studied directly from readily available published data.[68] Three of them are brachycephalic, two mesocephalic. The former have upper facial indices below 50, and nasal indices above 50; while the latter fall on the other side in each case. In the orbital index two of the brachycephalic crania fall below 80, and one above it; while both of the dolichocephals are above. In these five examples, then, the round skulls have short faces, low or broad noses, and low orbits, while the longer specimens are higher and narrower in face, orbit, and nose form.

The dolicho- and mesocephalic Swiss Lake Dwelling crania seem to belong without exception to some variety of small Mediterranean, such as might have entered either from the east or the southwest, with agricultural movements. The brachycephals, which are most numerous and least mixed in the earliest levels, form the one element in the Lake Dwelling racial complex which cannot be derived from known Neolithic sources, and may, therefore, be circumstantially linked to the Mesolithic element so important in Swiss Lake Dwelling cultures.

Besides the Lake Dwellings, with their meager supply of human remains but rich yield of cultural objects which have perished elsewhere, there are Neolithic sites of other kinds in Switzerland, including rock shel-

[67] Schlaginhaufen, O., *Die menschlichen Skeletreste aus der Steinzeit des Wauwilersees.*

[68] Covering the following crania:

(1) Pittard, E., **ASAG,** vol. 7, 1935, pp. 118–122. One female, Lake Neuchatel.
(2) Pittard, E., **Anth,** vol. 10, 1899, pp. 281–289. One female, Point, Lake Neuchatel.
(3) Schenk, A., **REAP,** vol. 15, 1905, pp. 389–407. One female, Lake Leman.
(4) Kollman, J., **KDGA,** vol. 29, 1899, p. 116. One female, Auvernier.
(5) Schlaginhaufen, O., *op. cit.* One female, Greifensee.

ters and cist graves. Most of these dry land burials, which were not, in most cases at least, Lake Dwelling cemeteries, contain human remains of Mediterranean type, although a few brachycephals have been found in them.[69]

The most extensive single series is that from the cist cemetery of Chamblandes, with ten male and eight female skeletons.[70] (See Appendix I, col. 14.) These remains are those of small, light-boned Mediterraneans, dolicho- to mesocephalic, mesorrhine, and shallow jawed, with very little metrical sex differentiation. Basically, these Chamblandes people resemble the smaller groups of predynastic Egyptians very closely, but are even closer to Muge. There seems to be a perceptible negroid element in the Chamblandes groups, which accentuates the African relationship. In vault size and height, they do not resemble the Danubians.

The Chamblandes culture was mid-Neolithic, and probably represents the northward intrusion of a semi-nomadic tribe or band from northern Italy, where cist burials of the same type have been found.[71] Since the Chamblandes physical type is an excellent example of the small Mediterranean race, that type must, therefore, have been prevalent in the Early and Middle Neolithic of northern Italy. Its presence furthermore illustrates the complexity of ethnic movements in Neolithic Europe.

The racial problems exposed by the study of Neolithic man in Switzerland apply equally to France, which presents an even more complex archaeological situation. Along the whole Atlantic coast, and most of all in Brittany, dolmens and other kinds of megalithic monuments were built in abundance. The north of France, especially the Paris Basin, formed the westernmost reflection of the Danubian invasions from the east, through the mixed cultures of southern Germany, but in the Paris Basin this culture was mingled with megalithic elements, since many of the burials are in hewn underground vaults and in dolmens.

The southeast of France contained a surviving cave culture, while the whole eastern section of the country, in the valley of the Rhône and the borders of Switzerland, was occupied by farmers with the same blend of Mesolithic and Neolithic cultural elements which in Switzerland appear in the western Lake Dwellings. Both Dechelette and Menghin derive the agricultural element in the French Neolithic south of the Paris Basin from North Africa.[72]

Although, if one may judge by the number of finds made, France was a densely populated country during the Neolithic, the distribution of

[69] Schlaginhaufen, O., *op. cit.*
[70] Schenk, A., **REAP,** vol. 14, 1904, pp. 335–375.
[71] Childe, *The Danube in Prehistory,* pp. 163, 174.
[72] Dechelette, J., *Manuel d'archaeologie prehistorique.*
Menghin, O., *Weltgeschichte der Steinzeit.*

people was very uneven. It is very likely that large areas, notably in the *Massif Central*, the mountain core of south-central France, where a thin soil and granite base are inimical to agriculture, were still inhabited throughout the Neolithic time span by scattered bands of Mesolithic hunters and grubbers. The bulk of the population lived in the great river valleys.

As an indication of the head form of the French Neolithic people, we may turn to a compilation of 608 crania, out of which 43 per cent are dolichocephalic, 38 per cent meso-, and 19 per cent brachycephalic.[73] Although this distribution is not bimodal, there are at least two types present, a long and a round one.

The long-headed type or types belong clearly to the Mediterranean category. Although most series include brachycephalic crania, a few are purely long headed. Some of them, such as the series from L'Homme Mort and Lozère [74] (see Appendix I, col. 15), are low dolichocephals, with means of 72; these approach but do not quite approximate the British Long Barrow standards of size. The skulls from the corridor tomb of Vaudancourt, Oise, are of full Long Barrow size, and the stature of the skeletons is tall. Thus there was, apparently, here and there, a tall, large, and very long-headed element in the French Neolithic, related to that which predominated in the British Isles. It was rarely, however, pure.

The mesocephalic crania are, as a rule, larger in vault size than most of the Mediterranean groups which we have studied, such as the Danubians, the Chamblandes series, and the Mesolithic skulls from Muge. One suspects that the mesocephaly so common among Neolithic French crania may, in part, be due to a mixture between a Megalithic, rather than a small Mediterranean, dolichocephalic type with brachycephals. This is supported by the evidence of stature, for means of French Neolithic series run to 164 and 165 cm., taller than the majority of Mediterraneans proper.

In certain definite ways, the long-headed crania of the French Neolithic, as a whole, show a western affiliation: the vaults are wider than they are high, and the noses are leptorrhine or low mesorrhine. In these respects they differ from the Danubians, as well as in size; and in the vault form, they differ from the Corded group. These peculiarities further strengthen the similarity between the longer and larger examples, and the British Long Barrow type. We may conclude from this that most of the Mediterranean racial element in France came from North Africa and the Mediterranean, and little from central and eastern Europe.

[73] Salmon, P., **REAP**, vol. 5, 1895, pp. 155–181. Series re-divided to agree with conventional partitionment of cranial index.

[74] Unpublished measurements by Mrs. Ruth Sawtelle Wallis.

The geographical distribution of Neolithic crania by head form can be partially determined from Salmon's study.[75] In all, forty-one departments are represented, covering less than half of France. Of these forty-one, only fifteen departments, one-sixth of France, have ten or more crania each. As far as we can tell from this fragmentary distribution, there were two centers of high brachycephaly, one in the Auvergne region, crossing the Rhône to Savoie, and fading out in the *Massif Central;* the second in the north of France, from Paris over to the Meuse. The Atlantic coastal region below Brittany, and the west central part of France, were dolichocephalic strongholds during the Neolithic.

The range of indices in the French Neolithic extends from 63 to 97, which is practically the normal range for the world. Whole groups of over thirty skulls (as at Beaumes Chaudes), found in single caves, are entirely long headed, showing that some purely dolichocephalic local populations existed in Neolithic France, as they do in parts of the country today [76] (see Appendix I, col. 16); while smaller interments contain wholly brachycephalic clusters. Hyperbrachycephaly had already developed as an evolutionary phenomenon, for twenty-five out of Salmon's six hundred and eight crania have indices between 85 and 97. Others over 90 were found in the Swiss collection. This extreme head form was not, apparently, as common then as it is today.

Salmon's list luckily contains data as to mode of interment as well as to cranial index and locality. Most of the crania come from either megalithic tombs or caves. Rock shelters and caves contain the same head form ratio as the total for France; and this is also true of the totality of megalithic tombs. Brachycephalic crania are found in all kinds of interments; there is nothing of an archaeological nature to distinguish them socially or ethnically from the others. They were, therefore, an integral part of the Neolithic population in all sections where they have been found. They cannot have belonged to a separate, unified group of immigrants, but formed rather a residual element in the total population, with a strong genetic impulse for the perpetuation and increase of its peculiar head form, regardless of other racial factors.

The further examination of this problem of western European brachycephaly can best be pursued by a study of Belgium, which formed an extension of the archaeological province of northern France during the Neolithic. Most of the sites of this period come from the Ardennes hills, from the present Walloon-speaking part of Belgium, for the swamps and fens of the Flemish country offered little inducement to Neolithic farmers.

[75] Salmon, *op. cit.*

[76] Bonin, G. von, considers the Beaumes Chaudes series a Palaeolithic survival into Neolithic times. **HB,** vol. 7, 1935, pp. 216–217.

It is perhaps for this reason that Neolithic Belgians were even more brachycephalic than their relatives in France—out of seventy skulls of both sexes,[77] one-half have cranial indices above 80. The largest series, that of Hastière,[78] has a mean of 79.8; and a high variability.[79]

Among the readily available published crania one may seriate eighteen male specimens [80] for which adequate measurements have been given. The eighteen adult male skulls divide themselves naturally into two subgroups, of eight and ten, respectively. The first ranges in cranial index from 74 to 77; the second from 80 to 83. This natural division is so marked that it would be futile to seriate the eighteen as a whole, for the mean would fall at a point unrepresented by a single specimen. Seven female crania which accompany this series likewise have none in the middle brackets.

The dolichocephalic group of eight male skulls belongs to a normal, Mediterranean type, mesocephalic, and relatively low vaulted. The brachycephals (see Appendix I, col. 17), the important group for our present purpose, may serve, through comparison, to help elucidate the problem of western European Neolithic brachycephaly.

In Switzerland we had only a few individual crania for study; in France the brachycephalic crania are mingled in individual series with dolichocephalic ones. In the small Belgian group of ten males, however, we have a purely brachycephalic series for comparative purposes.[81]

In searching for the prototype of these Neolithic Alpine skulls, one turns naturally to the few Upper Palaeolithic and Mesolithic crania of brachycephalic type for comparison.[82] In vault diameters, the Neolithic skulls correspond nearly to the Ofnet ones of the same sexes, but the female examples are smaller than those from the Upper Palaeolithic. All specimens, of all three periods, are low vaulted.

The Neolithic Alpine faces, insofar as we can judge, run somewhat smaller and narrower than do most of the earlier ones; the orbits are much the same, but the noses seem smaller in size. On the whole, the Neolithic brachycephalic crania are less rugged and much smoother than the earlier examples, more globular, and more infantile. The faces look, in many cases, little different from those of the Mediterraneans which accompany them. The stature of these brachycephals varies, but is greater than that of the accompanying long-heads, reaching 165 or 166 cm. for

[77] Including those on Salmon's list and others.

[78] Salmon, 1895, 33 crania.

[79] Range = 72–88, σ = 3.65.

[80] Anvers, 3; Sandron, 10; Préalle, 4; Grotte du Docteur, Huccorgen, 1.

[81] These crania come from the same series as the dolicho- ones, Sandron and Préalle, plus the Huccorgne cranium. There is no such thing as an *exclusively* brachycephalic Neolithic group of any size from any one place.

[82] Solutré #2, #5, Le Placard (1881). Solutré #1 and #3, and Le Placard F and B, are high mesocephals. Among Mesolithic crania, Ofnet 1800, 1801, 1802, 1806, 1815.

males in the few ascertainable instances. This correlation would favor the Upper Palaeolithic comparison.

It is impossible, in an orderly and logical manner, to explain the presence of these ancestral Alpines during the Neolithic in Europe west of the Alps, north of the Pyrenees, and south of the Rhine. But certain hypotheses [83] merit discussion, and by elimination of lesser probabilities we may narrow the field. The most important of these hypotheses are:

(1) *The Alpine brachycephals came into the area in question during the Neolithic period, as part of an agricultural invasion, from the east.* This theory, which has been accepted as fact by the majority of anthropologists for some thirty or more years, may be practically ruled out. All the evidence in existence serves to contradict it.

(2) *The Alpine brachycephals came into the area in question during the Mesolithic, as part of a preagricultural invasion, from North Africa by way of the Iberian Peninsula.* This theory is based upon the discovery of allegedly brachycephalic crania at Muge in Portugal. Vallois has recently shown that the Muge crania are in reality of Mediterranean type, and that most, if not all, of the alleged brachycephaly was due to the post-mortem deformation of a few skulls. Hence, in its usual form, this theory may also be considered unlikely, although less improbable than the first.

(3) *The Alpine brachycephals are Afalou type round-heads, carried up to western Europe with the Mesolithic movements from North Africa, or from Asia by some unknown Mesolithic movement.* We have already suggested that the Ofnet skulls might have had some such origin. But the Alpine crania are smaller, and more globular. The faces are much smaller, though similar in proportions. These differences may possibly be explained by mixture with small-headed and short-statured Mediterraneans.

(4) *The Alpine brachycephals represent a continuation of the Aurignacian brachycephalic tendency found at Solutré.* The Azilian culture was a blend of Capsian and Magdalenian elements. It is possible that a brachycephalic element from Palaeolithic France passed into this Mesolithic cultural expression, and was carried over into the Neolithic, which retained many Mesolithic cultural forms.

(5) *The Alpine brachycephals are the result of a genetic tendency toward a globular skull form acting on a dolichocephalic group.* Without reasonable doubt, there has been a tendency toward an increase in brachycephaly in the Alpine racial zone in modern times. We are as yet unaware of its true cause and of its mechanism. But we cannot, for various reasons, suppose that the Neolithic Alpines were merely brachycephalized Mediterraneans. They were often taller, and had larger vaults, lower orbits, shorter faces,

[83] The hypothesis that they were the ancestors of the Lapps serves in no direct way to explain their origin, and will be dealt with later.

and wider noses. Furthermore, the soft-parts of living representatives of this type are distinctly un-Mediterranean.

The true answer to the question, "What is the origin of the western European Alpines?" cannot yet be given. But we may be reasonably certain that they are older than the Neolithic, that they may owe part, at least, of their reduced size of vault and face to mixture with Mediterraneans, and that their round headedness possessed a strong genetic survival value. At the moment, the theory of an Upper Palaeolithic survival, somewhat reduced in head and face size, seems the most reasonable.

(12) NEOLITHIC SCANDINAVIA

Let us next move to the center of the second area of maximum Mesolithic survival—southern Scandinavia. Here the Neolithic cultures and techniques were late in arrival, and survived long enough to attain a considerable complexity, flourishing long after most of the rest of Europe was making common use of metal. The old Ertebølle country of Denmark and southwestern Sweden became the seat of a dense population of successful farmers and cattle breeders, partly derived from the old fishing and hunting stock, and partly from new immigrants who brought with them new ways of living. This part of Scandinavia, in the Sub-Boreal period, which followed the Litorina, and which witnessed the development of the Neolithic, was eminently suited to agriculture and cattle raising, for the climate was drier than at present, and four Fahrenheit degrees warmer in mean annual temperature.[84]

Neolithic impulses, when they eventually reached Scandinavia, probably no earlier than 2500 B.C., came into this region from more than one direction. It is possible that Danubian influences, transferred through South German mediums, were felt by the Ertebølle moor-dwellers at the beginning, and also that Neolithic cultural movements came directly to Scandinavia from South Russia. However, the first movement which can be traced with certainty was that of the Megalithic immigrants. These came by sea from the south and west, probably for the most part from the British Isles, although some may have come from Brittany as well. They brought with them not only the habit of erecting impressive burial monuments, but also agriculture and animal husbandry, which they may have been the first to introduce as a basic source of food supply, although Neolithic techniques may have come from the east and south before them.

The Megalithic invaders found a strong, settled population of fishermen and hunters, located mostly on the coasts, who apparently did not prevent them from establishing their farms and trading stations. The archaeo-

[84] Shetelig, Falk, and Gordon, *Scandinavian Archaeology*, p. 53. Much of this introductory material is based on their book.

logical record furthermore makes it certain that the aborigines were neither driven out nor destroyed, but survived to form an important element in the eventual Danish population.

The forms of the abundant megalithic monuments, in combination with weapon types, provide a scale for Neolithic chronology. After a tombless period characterized by round-poled axes, dolmens were built first, followed by passage graves, under specific influence from Brittany via Holland; and by Long Barrows brought, as a trait, from England by sea.

In the later part of the dolmen period and the beginning of the passage grave epoch, a new group invaded Scandinavia from the east and southeast, probably initially attracted by the rich supply of amber in Jutland. These were the so-called Battle-Axe people, who were simply our old friends the Corded people under their alternate name. Their route lay from Holstein up through Schleswig to Jutland, and only later did they reach the Danish archipelago, and Sweden. Having come from Germany, it is doubtful if they represented a pure Corded racial strain; this became less pure through blending with their predecessors in Scandinavia, the Megalithic and Kitchen-Midden peoples. The burial form of the resultant amalgam was the stone cist, a Megalithic-Corded compromise, with the corridor tombs and Battle-Axe single graves as prototypes.

During the entire Neolithic, almost all of Norway, as well as central and northern Sweden, remained in a food-gathering stage of culture, although Neolithic axes and other objects were traded to them from the south. There can be little doubt that to a large extent the northern hunters were direct descendants of Mesolithic, and hence of Late Palaeolithic, man. Many traits of their so-called Arctic culture have survived until recent times.

Without the knowledge of Neolithic movements and continuities provided by the careful work of the Scandinavian archaeologists, and without a previous study of the Neolithic racial situation in other parts of Europe, it would be difficult to interpret the human remains from the Danish and Swedish sites, since this is racially the most complex and most mixed section of the continent. The concept of Scandinavia as the home of a pure Nordic race or of any other single group during the Neolithic is a completely false one.

The total of Neolithic skulls from Scandinavia is well over two hundred;[85] of these nearly three-fourths come from Denmark. Only one repre-

[85] Principal sources:
Fürst, C. M., *Zur Kraniologie der Schwedischen Steinzeit.*
Nielsen, H. A., **ANOH,** 1905, 1911, 1915.
Retzius, A., *Crania Suecica.*

sents Norway, and this is a heavy-boned specimen, with strong browridges, a mesocephalic vault, mesorrhine nose, and low orbits; apparently a partial or complete Mesolithic survival.

In both the Swedish and Danish series, two main, mutually contrasting types are found. One is a very long, quite narrow, cranium of moderate height; with projecting occiput, parallel side walls, moderate browridges, a moderately sloping forehead, which is usually quite broad; a moderate upper face height coupled with a narrow breadth; mesoconch orbits of square form sloping downward at the outer corners; and a mesorrhine or leptorrhine nasal aperture. This type of skull, which comprises some thirty-nine per cent of the Swedish series, and five per cent of the Danish, was early recognized by Fürst as a counterpart of the British Long Barrow race, which occurs more frequently in Britain in unmixed form. In the Danish Long Barrow tombs of purely British type, the skull form is also identically British.[86] Most of the people of this type in Neolithic Scandinavia must have come by the western sea route around Britain; some, however, may have arrived overland from southern Russia in pre-Corded times.

This Megalithic form is not, however, the only long-headed type discernible among Scandinavian Neolithic long-heads; individual crania of Corded type with longer faces and higher vaults are not uncommon. A mean stature of 172 cm. for the long-headed skeletons [87] shows that the racial types involved were tall, taller than either the Long Barrow mean from England or that of the Corded group from Silesia and Bohemia. But this excess of stature cannot be taken to indicate a strong admixture in this type of Palaeolithic long heads, for the dimensions of the vault are not comparable, and the face is very narrow—as with both Megalithic and Corded crania elsewhere.

Unfortunately, it is impossible to follow the progress of these long heads through the different types and stages of Neolithic cultural development. Dolmen burials and those in corridor tombs have been classed together in Denmark—and may be contrasted with profit only with the skeletons from the later cist graves. In both groups there has been much mixture between long- and round-headed forms; a mean cranial index of 77 in each case indicates an intermediate condition. Since the brachycephalic element in each is probably the same, and apparently present in equal quantities, we may compare the two groups with some validity. The cist-grave crania are higher vaulted, longer and generally larger faced, and longer nosed than the Megalithic ones. In all diverging characters, the cist grave skulls differ from their Megalithic predecessors in a Corded di-

[86] Five crania from Danish Long Barrows.

[87] Pearson's formula, M = 172.4 cm. Nielsen's figure is 173.4 cm., based on Manouvrier's tables.

rection. Therefore, we are led to believe that a true Corded racial element did play a perceptible part in the formation of the Neolithic Danish population, and did not appear merely as sporadic individual specimens.

In Sweden, out of twenty-four male crania found in passage graves, only one was brachycephalic; for the most part a pure Long Barrow type is represented.[88] In the later cist graves, a much stronger brachycephalic element had entered. On the whole, the Swedish material runs more strongly to both extremes than that from Denmark (see Appendix I, cols. 18, 19); forty-nine per cent of the Swedish skulls are considered mixtures between the long- and round-headed forms; while in Denmark these total eighty-seven per cent. In Sweden, the round heads are concentrated in Skane, in the southwestern part of the country; in Denmark, they are commonest on the islands of Zealand, Laaland, and Falster. The long-heads were particularly prevalent in central Sweden and in Jutland and the islands of Fünen and Langeland. Brachycephaly, therefore, is centered around the Copenhagen region, and particularly the islands, which would naturally permit the greatest survival of people who derived their sustenance from the sea.

From every standpoint it seems indicated that this brachycephalic element in the population is associated with the preagricultural midden dwellers. Yet we know from our scanty list of Mesolithic remains that the basic element of that time was probably a long-headed, Brünn-like Upper Palaeolithic European survival. Many skulls of large, square-jawed brachycephalic type appeared toward the end of the Mesolithic or beginning of the Neolithic in Denmark and northern Germany. Most of them have been assigned, largely through caution, to the Neolithic rather than to the preceding food-gathering period. Such are the skulls from Kiel, from Plau, from Spandau, and numerous other sites.[89]

Whatever their date, they resemble the brachycephalic crania of undisputed Neolithic age very closely. The latter, in turn, are sufficiently numerous for accurate racial evaluation. The Danish and Swedish brachycephalic people were tall, with a mean of 168.2 cm.,[90] and heavy boned. Their skulls are large, high vaulted, and with lengths greater than those common to most crania of equal index. The browridges are usually heavy, the foreheads often sloping, the lambdoid region is flattened often, the occipital region more rarely. The face is short and wide; the orbits square and moderately low; the nasal skeleton often prominent; the nasal index

[88] Fürst, *op. cit.*
Retzius, *op. cit.*
[89] Aichel, O., *Der deutsche Mensch.*
Clarke, J. G., *The Mesolithic Age in Northern Europe.*
Kossinna, Gustav, *Ursprung und Verbreitung der Germanen*, **MannusB**, #6a, 1928.
[90] Pearson's formula, 170.7 cm. by Manouvrier's tables.

usually leptorrhine or mesorrhine; the lower jaw heavy, wide, and angular. There seems little reason to dispute the conclusion that this type of skull is closely related to that found at Ofnet, Bavaria, in the Mesolithic; and that it is at least strikingly similar to the Upper Palaeolithic brachycephals from Afalou bou Rummel in Algeria, to which the Ofnet crania have already been compared. Individual Scandinavian crania can be matched with others from Afalou.

Brachycephalic crania are not infrequent in the Neolithic graves of central and southern Germany, in which we have already found them mixed with long-headed varieties. The same is also true of Poland. In the southwest, the Danish brachycephalic type, commonly given the name of the site Borreby, is found as far from its apparent center as Belgium, where the three crania of Sclaigneux are probably marginal representatives.[91] In the absence of further knowledge, one cannot definitely state that this brachycephalic type was the principal one of the Ertebølle kitchen-midden period, or that it was not. But it seems most reasonable to suppose that it was native to southern Germany during most of the Mesolithic, with extensions westward and eastward; and that at some time during the Late Mesolithic or initial Neolithic it filtered into northern Germany and the coastal zone from Belgium to Denmark and southern Sweden where it survived the Megalithic and Corded invasions, and where it is still present today.

It is interesting that in the whole stretch of the European continent in which Neolithic invaders blended culturally with the previous Mesolithic population, from southern France to Sweden, some form of brachycephal should appear. This northern Borreby type is different from the Alpine of France, Switzerland, and Belgium in a number of ways. The vaults are higher, the orbits somewhat lower, the faces larger, the jaws heavier. Whereas the French crania are usually globular, many of the Borreby ones resemble modern planoccipital types in angularity of vault form. The Borreby people, while shorter than their longer-headed companions, were quite tall; the Alpines, frequently taller than theirs, were shorter than the northern brachycephals. One is tempted to interpret the difference partly in terms of the types with which each mixed; a Megalithic and Corded mixture with an Upper Palaeolithic brachycephalic type would have a quite different result from that of a Danubian or Spanish small Mediterranean strain with the latter. In either case, we still may ask: What became of the long-headed Palaeolithic element which accompanied the brachycephals both in western Europe and northern Africa?

But this problem is far from solution; we have established the presence

[91] Virchow, R., **AFA**, vol. 6, 1873, pp. 85–118. In Virchow's article skull #3 is the subject of a misprint. The length should read 175 mm., the breadth 151 mm.

of brachycephals in the earliest Neolithic horizons in various parts of western Europe, in each case in connection with a strong Mesolithic cultural survival. We must await further evidence from the mysterious Mesolithic for an answer.

(13) NEOLITHIC INHABITANTS OF THE NORTHERN FORESTS

From the Baltic to the Urals stretches a belt of forests and swamps, crossed by many rivers, which long formed a shelter for primitive hunters and fishers, while the steppes to the south were overrun by successive groups of farmers and pastoral nomads from the earliest Neolithic until modern historical times. This northern cultural backwater forms environmentally a westward extension of the vast Siberian expanse of tundra and taiga; since early pre-Slavic days it has been the home of various tribes of Finns, some of whom once led, on European soil, a life much like that of the Siberian Ostiaks and Voguls of recent centuries.

In the Neolithic time-expanse, in the general European sense, the inhabitants of these forests lived by hunting and stream-fishing, in a manner reminiscent of their Maglemose predecessors. A few cultural innovations filtered northward from the agricultural lands, and among these was pottery, decorated by comb-impressions and other characteristic marks which render it easy to identify. Within the last few years there has been much discussion about this combed pottery, for it has been found in a more or less continuous band from Finland across Russia into Siberia, and then again at various points across the northern forest region of North America to the Atlantic. A school is rapidly forming which believes that this type is circumpolar and boreal, non-agricultural, and associated with the hunting and fishing peoples of the entire north. An impressive roster of archaeological authorities, including Kossina, Ailio, and Childe, believes that in Europe it was associated with an early Finno-Ugrian forest people, the direct ancestors of the various Finnish groups of today.[92]

The skeletal evidence from the Neolithic of this forest belt, while not abundant, is sufficient to show that racial uniformity did not characterize this widespread cultural province. Fifteen crania from the Neolithic of the shores of Lake Ladoga [93] are almost equally divided into two types; a normal South Russian dolichocephal, presumably of the extreme long-headed type, with narrow face and nose; and a mesocephal which does indeed have a Finnish appearance in the modern sense. Skulls of the latter type are characterized by low orbits, short, broad noses, and wide faces, which as individual examples exceed the accompanying brain case in width. This face and head form bears a certain Crô-Magnon-like

[92] Childe, V. G., "Adaptation to the Postglacial forest on the North Eurasiatic Plain," in McCurdy, G. G., *Early Man.*

[93] Bogdanov, A. P., 1882; from Saller, K., **AAnz,** 1925.

implication, and may indeed indicate descent from some eastern Upper Palaeolithic form as yet undiscovered.

At Salis Roje, in Livonia on the Gulf of Riga, another collection of thirty-one Neolithic crania is even more varied.[94] This includes not only the types present at Lake Ladoga, but also a short-statured, brachycephalic form, with a long face, slight prognathism, high orbits, and a broad nose. Morphologically, there is said to be a mongoloid appearance to these crania. This adds, therefore, a third element to the northern forest population during the Neolithic.

Farther to the east, at Volosovo on the bank of the Oka River, a subbrachycephalic skull from the same cultural horizon would apparently fit into the Finn-like Ladogan category.[95] Across the Urals in Siberia, the essentially European character of the Comb-Pottery people comes gradually to an end. A female skull from Bazaiha [96] in the Krasnoyarsk district resembles the Salis Roje brachycephalic type, but has a narrow, prominent nose. This specimen has been likened to a form typical of modern Turko-Tartar women. Farther to the east, one encounters a hyperbrachycephalic, fully mongoloid skull from Kokui on the Transbaikal railroad,[97] and beyond that the extensive and carefully studied Neolithic series from Lake Baikal, the main type of which Debetz finds identical with the crania of modern Tungus.[98]

In summarizing this material, we shall not dispute the opinion of the archaeologists who have concerned themselves with this special field that the participants in the comb-ceramic hunting and fishing culture of northern Russia and the forests to either side were the cultural ancestors of some, at least, of the modern Finno-Ugrian-speaking peoples. But the racial aspect of the problem is far from simple; at least three elements were present; an extremely long-headed Mediterranean form with southern connections; a Crô-Magnon-like broad-faced, low-orbitted mesocephal, filling most closely the requirements of an ideal modern Finnish type; and a small-statured brachycephal with a long face and high orbits, which in some instances is at least partly mongoloid. As will be seen later, the subbrachycephalic element in the Danubian population was probably related to these non-Mediterranean forest types.

(14) CONCLUSIONS

The survey of the white race during Neolithic times, which has required the wholesale examination of a large number of skeletal remains and their

[94] Virchow, R., **ZFE**, vol. 9, 1877, p. 412. Also, Saller, K., **AAnz**, 1925.

[95] Pavlov, A., **RAJ**, vol. 16, 1927, p. 56. See also Ouvarov, A. S., *Archaeologie de la Russie.*

[96] Dus, **AF**, vol. 1, 1923, pp. 72–78. Also, Saller, K., **AAnz**, 1925.

[97] Dus, *ibid.* Saller, *ibid.*

[98] Debetz, G., **RAJ**, vol. 19, 1930, pp. 7–50.

placing in space, time, and cultural settings, has led to a number of definite conclusions, some of which are as final as anything can be in the present state of physical anthropology, and others which are admittedly both tentative and tenuous.

The Neolithic manner of living differs radically from that of Palaeolithic and Mesolithic man, since it involves the production of food by agriculture and animal husbandry. The plants and animals themselves are not of European origin, but are native for the most part to western Asia. Neolithic civilization had probably begun in Egypt, Mesopotamia, and possibly the Indus Valley by 5000 B.C. The people who discovered or invented this control over nature probably belonged to the purely *sapiens* branch of the white race in the larger sense, including a group of related dolicho- or mesocephalic types which did not form part of the more specialized European and North African Upper Palaeolithic group, although they were closely related to such generalized forms as Galley Hill and Combe Capelle.

Members of this larger racial group invaded Europe from several quarters, starting in the latter part of the fourth millennium B.C. Their principal avenues of approach were from North Africa through Spain, from the Mediterranean to western Europe by sea, across the South Russian plains, and up the Danube Valley. The Danubian migration may have been fed by streams from north of the Black Sea, from Anatolia by way of the Bosporus, from southern Anatolia and points farther south and east by way of Greece, or by some combination of these three. The exact source or sources of the Danubian migration remain to be determined. Another avenue was to Greece and Italy from the east by sea.

The invaders may be divided into a number of sub-types. First, there is a basic cleavage into a short-statured, sexually undifferentiated, relatively small-headed and frequently mesocephalic variety which fits most closely the specifications of the Mediterranean race in the more commonly used sense of that term. There were three groups of Neolithic culture bearers who belonged principally if not entirely to this type: the Danubians; the farmers and swineherds who moved westward along the fertile coastal regions of North Africa, and over into Spain and thence northward to France and Switzerland; and the sea-borne settlers of Italy, and probably also of Greece. The Danubians are distinguished by a particularly high cranial vault and high nasal index; the western branch by a lower vault and narrower nose. To the latter class belonged also the ancient Egyptians.

The other half of the Neolithic Mediterranean race is noted for tall stature and a more extremely dolichocephalic skull form. This variety was found in East Africa; it was also common in early Mesopotamia and

Iran, while the Egyptians belonged more nearly to the smaller Mediterranean variety. This tall, longer-headed half of the race is longer faced, narrower nosed, and less delicate in bony structure than the other. It also seems to fall closer to such possible prototypes as Galley Hill and Combe Capelle from the Palaeolithic.

This tall branch is again sub-divided. One sub-branch, with moderate vault and face heights, travelled, in all likelihood, by sea from the eastern Mediterranean to Gibraltar, around Spain, and up to western France, Britain, and Scandinavia. In the last two countries, and especially in the British Isles, it contributed an important element to the population. It is not easy to find the prototype of this Megalithic group; some of the Mesopotamians seem to have been very close to it metrically, and some East Africans as well; we shall later find evidence of it on the shores of the Black Sea. For the moment we can only postulate that it came from some as yet unidentified part of southwestern Asia, southeastern Europe, or northeastern Africa.

The other sub-branch, characterized by an extremely high cranial vault and a very long face and nose, moved westward from the plains of southern Russia and Poland into central and western Europe. The members of this group, who were culturally associated with Corded pottery, performed a different part in Neolithic history from that of the Danubians. They were not peasants, but traders and presumably warriors. Their final destinations were southern and central Germany, especially Saxony and Thuringia, and southern Scandinavia. From a late center in the Rhinelands, they were destined to play an important part in subsequent metal age prehistory.

The Neolithic population of Europe did not wholly consist of these various invaders just described, although they perhaps made up the more numerous element in the whole. In the western and northern fringes, away from the gates of entry, earlier peoples of Mesolithic and even Palaeolithic tradition remained. In Spain, Portugal, and Italy small Mediterranean types of pre-Neolithic or Early Neolithic dating may well have blended with the invaders in large numbers, but since the two elements would have been much the same it is impossible to determine the proportions of each.

In France, Switzerland, and Belgium a major survival of Mesolithic cultural factors into the Neolithic is accompanied by a large brachycephalic increment, which is indubitably related to, and in some degree ancestral to, the modern Alpine race. Farther north, from Belgium to Sweden and particularly in the Danish archipelago, one finds, under similar circumstances of cultural survival, a numerous brachycephalic element, called the Borreby type, which is somewhat different from the

ancestral Alpine form farther south. The northern brachycephals were larger headed and definitely higher vaulted and wider faced; with taller stature, heavier limb bones, and in many cases heavy browridges, wide jaws, and low orbits. The shape of the skull is sometimes angular, while that of the Alpines is perhaps more often globular, although this difference does not apply to all individuals and should not be overstressed.

Both the Alpine and the Borreby types bear strong resemblances to the few known brachycephalic examples of Upper Palaeolithic crania. The Borreby type in particular resembles those from Afalou bou Rummel in Algeria. Both also resemble the Mesolithic skulls from Ofnet in Bavaria. There can be little doubt that brachycephalic man in western Europe was not a Neolithic importation but a Mesolithic survival. It is possible that these two types evolved from Palaeolithic man by some process which involved the disappearance or absorption of the normal, long-headed and numerically more important element. It is also possible that they came into Europe during the Mesolithic from some source or sources unknown. The Mesolithic is still so much of a blank in the racial sense that almost any movement might have taken place without detection.

Northern Britain, parts of Ireland, Norway, and the north of Sweden formed an area of isolation during the entire Neolithic, into which the ideas and products of civilization gradually and only partially seeped. We do not know, from contemporary evidence, that Palaeolithic man of the type already indicated in the same regions during the Mesolithic, survived in these spots through the Neolithic, but later evidence will make that assumption reasonable.

The forests of northern Europe east of Scandinavia were inhabited by a hunting and fishing people who formed part of a general circumpolar cultural group which probably extended with little technical change across Siberia to the Pacific, and may have influenced North America. In the European and western Siberian segment of this belt, eminent authority opines on cultural grounds that the Neolithic inhabitants were the direct ancestors of an element in the modern Finno-Ugrians physically, although not necessarily linguistically. The skeletal remains from this region, while few, yet reveal the presence of at least three separate types; a presumably Corded variety of Mediterranean; a Palaeolithic-looking mesocephal with low orbits and a wide face, which does simulate an element common among the modern Finns; and an incipiently or partially mongoloid brachycephal, with high orbits, a long face, and a prominent nose, resembling certain modern central Asiatic Turks.

The racial history of Europe in the Neolithic, therefore, is a problem in

the balance between new racial streams of relatively uniform type which poured in from the south and east, and older, residual elements which survived or suffered amalgamation in the west and north. It again reveals the marginal character of Europe in the racial as well as cultural sense, and shows the necessity of a greater knowledge of race in Asia and in Africa if we are to understand our own origins.

Chapter V

THE BRONZE AGE

(1) INTRODUCTION

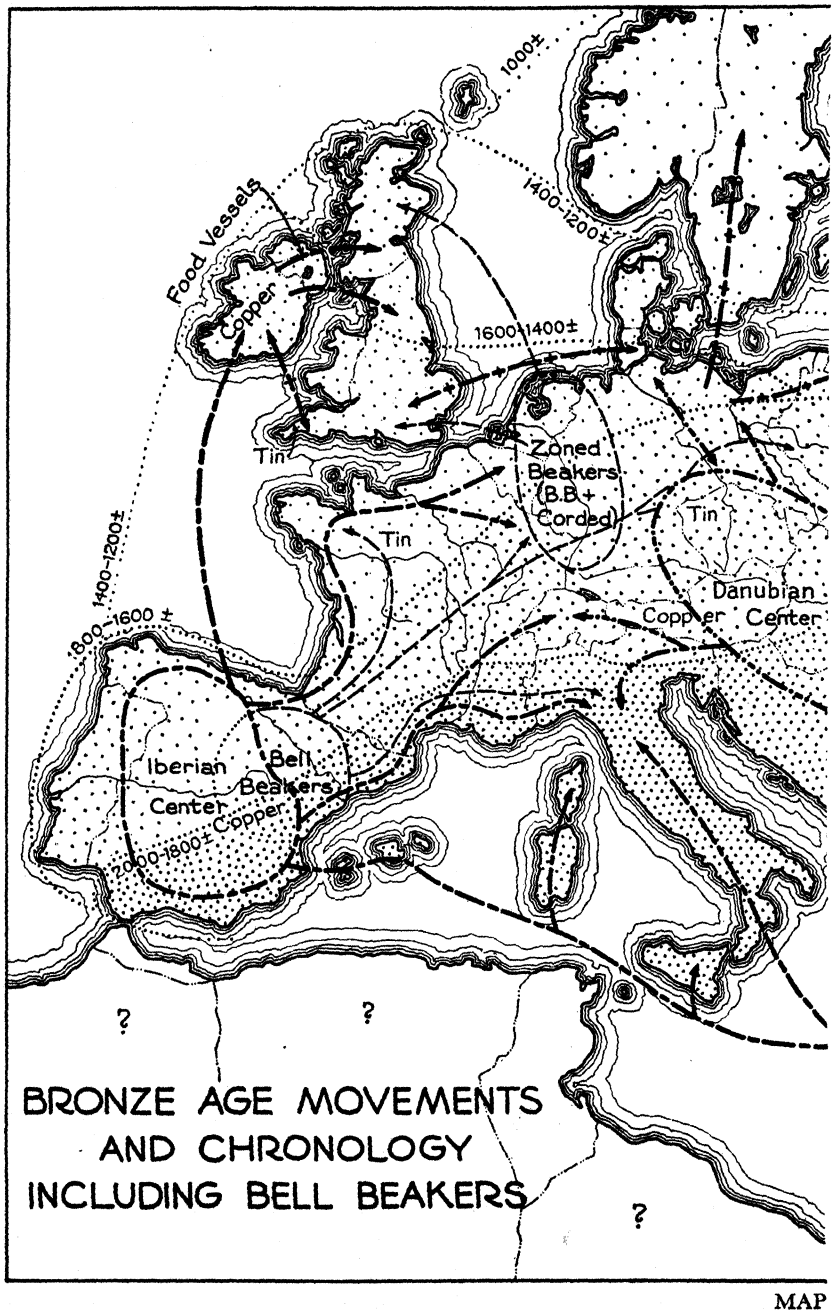
The dividing line between the Neolithic and the age of metal is difficult to draw and essentially artificial. Like that of any other material, the introduction of copper and bronze into Europe was a gradual process. In much of the continent the use of this new substance was first implanted on established agricultural peoples, and for this reason it is generally supposed that the Bronze Age was a period of cultural diffusion but racial quiescence. This supposition is only a half-truth. In the areas of high civilization, in which metal was first notably used—Mesopotamia and Egypt—the continuity of local branches of the Mediterranean race remained quite constant in these thickly settled and well-established valleys. That this was by no means equally true of the lands to the north and west, we shall presently see.

The Bronze Age was a period of ethnic complexity. It is a unit only in the common use of a single metallic alloy by a number of peoples who obtained the technique of producing tools, weapons, containers, and ornaments of this substance from the lands of earliest civilization. Within its span occurred major shiftings of population, if not equalling, at least comparable to those of the Neolithic.

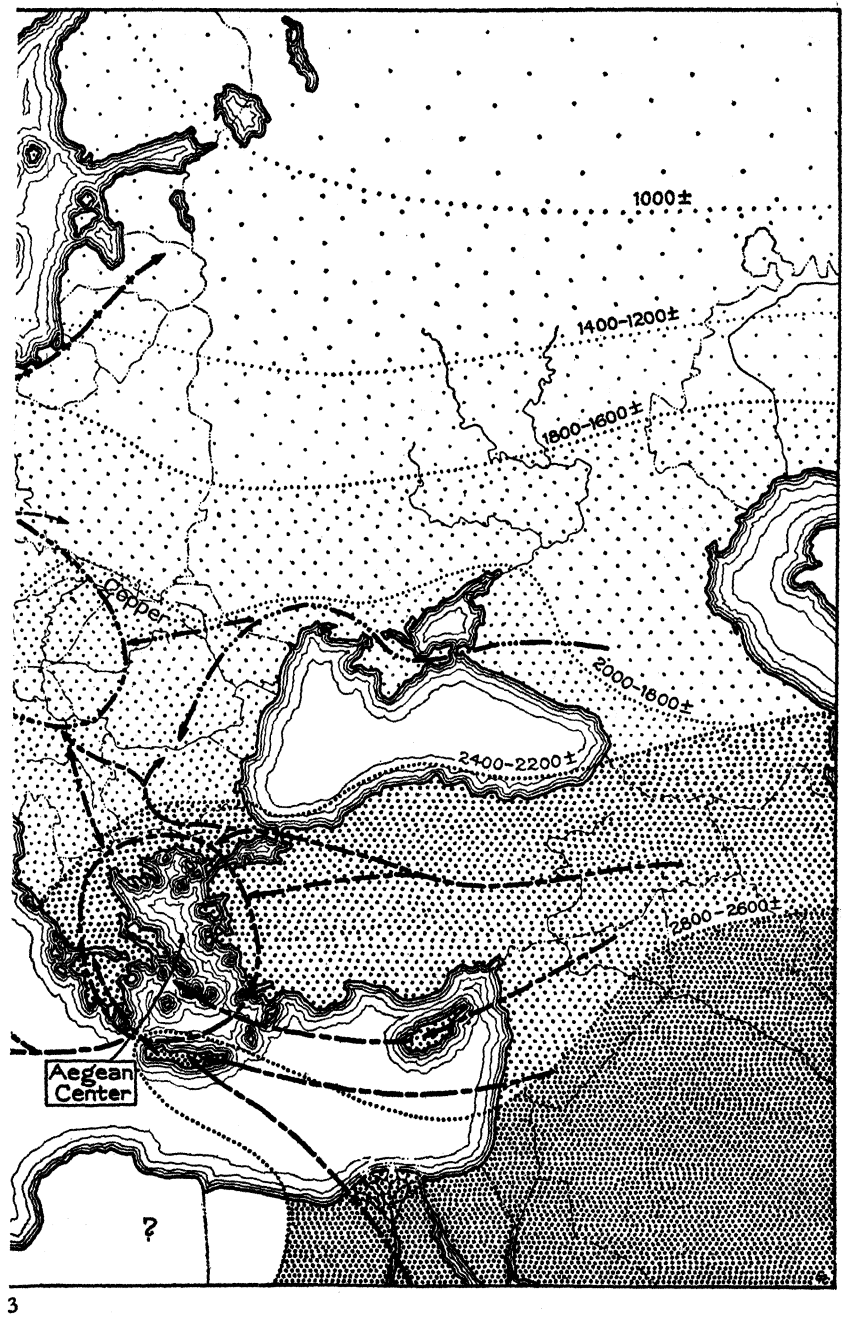
In the East, where bronze was early and iron late, the Bronze Age lasted for fifteen hundred years or more. In Mesopotamia and Egypt the efflorescence of high civilization occurred entirely within the Age of Bronze, and by the time that the harder metal had come in, the highest cultural levels had long been attained, and the two valleys had lost their cultural leadership.

In Europe, however, bronze furnished in many regions but a brief interlude of a few hundred years between stone and iron. Only in far peripheries, as in Britain, where iron arrived tardily, did the Bronze Age flourish long. Here, as in Mesopotamia and Egypt, it lasted nearly fifteen hundred years; but the two equal spans barely overlapped. A Neolithic child in Denmark might have had a Bronze Age father; similarly a Bronze Age child in Britain might have been begotten by a lonely Kelt trained in the use of iron and visiting the western islands before his people.

Most authors make a distinction between the Ages of Copper and of Bronze. In both Mesopotamia and Egypt there was an experimental


1000±
1400-1200±
Food Vessels
Copper
1600-1400±
Tin
Zoned
Beakers
(B.B+
Corded)
Tin
Tin
1400-1200±
1800-1600±
Danubian
Copper
Center
Iberian
Center
Bell
Beakers
2000-1800± Copper
?
?
?
BRONZE AGE MOVEMENTS
AND CHRONOLOGY
INCLUDING BELL BEAKERS

MAP


1000±
1400-1200±
1800-1600±
Copper
2000-1800±
2400-2200±
2800-2600±
Aegean
Center
?

3

period before the use of tin as an alloy, and the determination of the proper proportions of the two metals, were known. Copper spread northward and westward in these early days, and many of the weapons and ornaments of western Europe in the so-called Chalcolithic or Aeneolithic (Copper Age) period resemble early Egyptian or Sumerian forms. The earliest copper and bronze objects were carried to outlying and barbarous parts by traders, and could only be obtained by those who had something to offer in exchange. The Aeneolithic Italian or Spaniard could no more produce a metal dagger than a modern Arab can make a machine-gun. In the full Bronze Age, however, imported ingots were cast locally into the desired form, and there was a smith in every village of consequence.

During the Neolithic, the farmer or herdsman could shape most of the tools and containers which he needed from local materials. Trade was carried on more in luxury objects such as sea-shells, than in primary necessities. But during the Bronze Age, trade affected everyone, for the metal with which ordinary tools and weapons were made came from relatively few places. Copper came from Spain, the Carpathian region, and the Caucasus. Tin was found in Bohemia, Cornwall, and again in Spain. Extensive trade necessarily arose to bring the products of these mining regions together.

In order to possess bronze objects, the European peoples needed some valuable commodity to give in exchange. In the north, this was of course amber. The principal amber road ran from Denmark to Saxony and Thuringia, to Bohemia, to the Inn River in Austria, and over the Brenner Pass to the Po. The people of Bohemia acted as middle-men, buying amber from the Danes with gold which they had obtained from Transylvania in exchange for tin. Thus, even in the Bronze Age, European culture rested upon a basis of interchange of local products.

This extensive trafficking in material objects must have implied considerable travel on the part of a large class of merchants. Such travel necessarily meant exchanges of populations in some degree. Childe believes that the earliest Bronze Age objects made in central Europe were cast by artisans who had emigrated from southern Russia or Asia Minor, forming little colonies in the barbarous European villages.

The Neolithic period in most of Europe fell in a wet, warm climatic age during which much of the continent was covered with forest, and this profusion of vegetation had hindered migrations and the development of pastoral nomadism. During the Bronze Age, however, the Sub-Boreal climate,[1] which then prevailed, was more continental and drier; and regions which had formerly been forested now became parkland, or in many cases open steppes.

[1] Much of the Neolithic of Scandinavia, where the Bronze arrived late, fell also in the Sub-Boreal.

In many parts of the north European plain the drought may have been great enough to discourage agriculture and to force some peoples to rely wholly on their flocks and herds, thus changing their habit of life from farming to pastoral nomadism. Droughts of this kind also fostered tribal migrations, and political disturbances in Mesopotamia and Anatolia, in the early part of the second millennium B.C., indicate that widespread movements of economic origin were prevalent at this time.

About the middle of the Bronze Age we find the first definite evidence of the domestication of the horse as an animal of traction. Horse-using nomads invaded Mesopotamia and brought about the Babylonian Dark Age. Others, the Hyksos, appeared in Egypt, where they first conquered the Delta, and then obtained control over the entire kingdom. In the absence of definite information, it has been supposed that these inroads were the indirect result of desiccation farther north, where the steppes had become too dry for cultivation, and the erstwhile farmers had turned to pastoral nomadism.

Although all movements on the eastern European plain were by no means westward, we may find, in later times, significant parallels to the Bronze Age migrations which brought the Hyksos to Egypt, the Našili-speakers to Asia Minor, and other barbarians to Mesopotamia. The westward migrations of the Scyths, Huns, Turks, and Mongols were simply consecutive events in a reciprocal sequence which may have commenced long before the days of Herodotus.

All Bronze Age movements were not entirely overland, however. Metal seekers from the eastern Mediterranean followed the megalith-builders along their sea route from the Aegean to the Italian islands, thence to Spain, and around Gibraltar to Britain and the north. During the Late Bronze Age movements of peoples may be established archaeologically, but the racial interpretation is complicated by the adoption of that unfortunate practice, cremation, which destroys the evidence which physical anthropologists require.

(2) THE BRONZE AGE IN WESTERN ASIA

The age of metal began in Egypt and Mesopotamia early in the fourth millennium B.C., and by 3000 B.C. it had spread to the Aegean and to Anatolia. Crete probably received metal age influences from Palestine and Egypt before most of the Anatolian mainland. Cyprus, which bears the same name as copper, was another early center. In the diffusion of early metal age culture westward along the Mediterranean and northwestward up the Danube, the peoples of Asia Minor, Cyprus, Crete, and the Aegean played an important rôle, acting as transmitters of impulses which had originated in Egypt and Sumeria.

Let us first examine what Bronze Age skeletal material there is in Asia Minor. So far, all of it comes from two sites, Alishar Hüyük, which, in its later periods, was a Hittite city, and Hissarlik, the seventh level of which was Homer's Troy. Both were important centers in the Bronze Age. At Alishar, fifty-three skulls have been studied, from seven archaeological periods, ranging from the earliest Copper Age, dated from between 2600 and 2300 B.C., to the Osmanli invasion.[2]

Ten crania from the earliest period (two "Chalcolithic," eight Copper Age) are uniformly Danubian in type, both metrically and morphologically. The small, high-vaulted, somewhat infantile dolicho- and mesocephalic form, with small face and mesorrhine to chamaerrhine noses, is no different from that found at roughly the same time at Anau, at Mariupol, in the Kiev Government, and in the Danube Valley, in association with Neolithic cultures. Two others, which are longer, may belong to a Megalithic or Corded variety. The unity of the early food-producing peoples on both sides of the Caucasus and Black Sea is therefore indicated, and from the racial standpoint, the Danubians could have come to central Europe from either South Russia or Anatolia, or both.

In the second and third periods at Alishar, dated between 2300 and 1500 B.C., and called the Early Bronze Age, brachycephalic skulls appeared, and these persisted through the period of the Hittite Empire, for several centuries after 1500 B.C. The crania are large, low vaulted, and only moderately brachycephalic, with lambdoid flattening, and moderate browridges. The faces are of medium length, and narrow, although somewhat broader than those of the earlier Danubian type. The stature of the one male observed was tall, 174 cm.[3]

Not all of the Hittite Empire crania are brachycephalic. A long-headed variety, which seems to have replaced or outnumbered the brachycephals by the time of the Phrygian invasions, is both longer and lower vaulted than the Danubian type of the Copper Age; it is characterized by a very prominent nasal skeleton of true Near Eastern form, with little nasion depression. Bas-relief sculptures of historic Hittites reproduce this hook-nosed, open-eyed type of countenance.

The sequence of racial types in Asia Minor during the metal ages probably runs somewhat as follows: the earliest food-producing people were the same as those in western Turkestan and southern Russia. The latter probably came in earlier times from the highland belt of which Anatolia

[2] Kansu, Shevket Aziz, **TAM,** vol. 6, #10, 1930, pp. 25–30; *ibid.*, vol. 10, #15–16, 1934 pp. 105 seq.; **BTTK,** vol. 1, #1, 1937, pp. 192–202.

Krogman, W. M., **POIC,** #20, 1933, app. #4, pp. 123–138; "Cranial Types from Alishar Hüyük," in H. H. von der Osten, *The Alishar Hüyük*, **POIC,** #30, Chicago, 1937, Part iv, pp. 213–293.

[3] Kansu, Shevket Aziz, 1937, Skeleton #3.

forms a part. Shortly before 2000 B.C., a moderately brachycephalic type, with tall stature, entered Anatolia from regions yet to be determined, followed by a low-vaulted, hawk-nosed Mediterranean form, which we have named "Cappadocian," and which is well known in the present day Near East. True Armenoids or Dinarics were not, apparently, common in early times.

During the third millennium B.C., the city of Troy, located strategically on the eastern shore of the Bosporus, grew from a village to a city, and acted as the most important center of diffusion for Bronze Age culture to the north and west, especially to the Danube Valley. Troy II, the first real city, lasted through much of the third millennium, and was razed soon after 2000 B.C. The skull of one young female from this level [4] seems to represent the same brachycephalic type found at Alishar, with which it was probably contemporaneous. If craftsmen and immigrants were passing over the Bosporus at that time, carrying metal techniques to central Europe, we may, therefore, suppose that some of the few round-heads found in sites in the Balkans, who were at last entering Europe from the east, came from this quarter.

FIG. 26. HITTITE.

After Schäfer, H., and Andrae, W., *Die Kunst des alten Orients*, 1925, p. 554.

Toward the end of the second millennium was built the Ilium which the fair-haired Achaeans were later to lay waste; and the settlements between the important third millennium city and that of Homer's heroes were but minor villages. Troy III (Schliemann's sequence), which existed through the first century or more of the second millennium, has yielded two male and one female skulls.[5] These three belong to one type; a large dolichocephal, with low to medium vault, and a face of moderate size. In general, they resembled the "Eurafrican" type prevalent in Mesopotamia at the same time, and the Long Barrow or Megalithic Neolithic form. Homer's Troy, which falls wholly within the Bronze Age, is sterile of skeletons.

In Palestine, at the city-site of Megiddo, twenty-seven skulls have been taken from the Copper Age or Chalcolithic level, dated before 3000 B.C., and five more from the immediately following Early Bronze Age horizon,

[4] Schliemann, H., *Ilios, City and Country of the Trojans*, pp. 270–272.
[5] Schliemann, H., *op. cit.*, pp. 509–512.

which lasted until about 2600 B.C.[6] The crania from both levels are small dolichocephals, of a Mediterranean type; they are delicate and feminine in aspect, and sexing is difficult. The nose is prominent, with a high root, which often springs directly from glabella without nasion depression. Yet in many cases a break in the lateral profile is formed by a bulbousness of the forehead above glabella. The occipital development is great, and prognathism is not uncommon.

The high-nosed Cappadocian element found in Alishar Hüyük from the time of the Hittite Empire onward was also, therefore, the prevailing racial type of at least one important city of Palestine during the same period. Four Bronze Age skulls, two each from the Mount of Olives and Aïn Jebrul, may be included in the same category.[7] One brachycephalic skull, however, has been found in Bronze Age Palestine; in the cave of Umm Qatafa, in the Wady Khreitum.[8] This belonged to an adolescent, presumably a male, with a vertical forehead, small browridges, and a vertical occiput. With him was a large, prognathous dolichocephal. These two were not buried in the cave, but had been trapped by a fall of rock.

Returning to Megiddo, we are told that "the skulls from the Hyksos and Late Bronze Age burials differ markedly from the Early Bronze and Chalcolithic specimens, and altogether appear to form another major physical group." [9] What the features of this later group may have been, we cannot determine without further information. But we have one other indication of racial types in the Bronze Age Near East, and that is the pictures on Egyptian monuments, which almost without exception show western Asiatics as white-skinned, bearded, and aquiline-nosed. Some are blond, but most are brunet.

After Alishar, our next good series of Near Eastern Bronze Age crania comes from Cyprus. The Bronze Age culture which flourished in this island is divided into three periods; Early, Middle, and Late Cypriote; from 3000–2100, 2100–1600, and 1600–1000 B.C.[10] Three skulls from the early period include two brachycephals, which are too fragmentary for further study, and one high-vaulted mesocephalic example. In the early and middle periods combined, twenty skulls have been studied. Of these, forty per cent, mostly from the middle period, are brachycephalic.[11] (See Appendix I, col. 20.) The population was clearly mixed, with a long-

[6] Engberg, R. M., and Shipton, G. M., *Notes on the Chalcolithic and Early Bronze Age Pottery of Megiddo*, pp. 44–46.

[7] Henckel, K. O., **ZFMA**, vol. 28, 1930, pp. 238–243.

[8] Neuville, R., and Boureau, R., **BSAP**, ser. 8, vol. 1, 1930, pp. 33–36.

[9] Engberg and Shipton, p. 46.

[10] Fürst, C. M., **LUA**, N. F. Bd. 29/6, 1933.

[11] Fürst's 3 EC and 2 MC crania, and Buxton's 15 EC + MC. See Fürst, *op. cit.*; Buxton, L. D., **JRAI**, 1920, vol. 50, pp. 183–235; Massari, C., **APA**, vol. 59, 1929, pp. 65–75.

headed hook-nosed Hittite-like element, and a brachycephalic one. In the Late Cypriote period, seventy per cent of forty-seven skulls were brachycephalic. The round-headed element was clearly on the increase during the Bronze Age, and it may have begun entering the island at any time between 3000 and 2100 B.C. Judging from the evidence of Asia Minor and Palestine, we may suppose that this took place nearer the late than the early date. At the end of the Bronze Age, iron-using invaders re-established dolichocephaly.

The long-headed element in Bronze Age Cyprus was, apparently, the typical Cappadocian, or Near Eastern variety of Mediterranean. In the

FACIAL TYPES IN BRONZE AGE CYPRUS

FIG. 27

FIG. 28

Gjerstadt, J.; Lindros, J.; Sjöqvist, E.; Westholm, A.; *Swedish Cyprus Expedition*, Stockholm, 1935. Vol. ii, plates CCXVI and CLXXXIX.

Late Cypriote period, during the prevalence of brachycephaly, an attempt was made through artificial deformation to lengthen the head form, producing the so-called "Hittite" style of deformation. In Egypt, Ikhnaton's head was similarly deformed, as were those of his two daughters.

The round-headed element in Cyprus, which appears identical with that from Alishar, is numerous enough to warrant statistical comparisons. Fürst calls the skulls Armenoid, and they do resemble Iron Age and modern Armenians quite closely in vault size and proportions, but the faces and noses of the Cypriotes are smaller in both height and breadth.

At the same time, they resemble modern Alpines in vault size, while the faces are narrower. The bloc of early brachycephals of western Europe and North Africa which includes Afalou, Ofnet, and the Borreby skulls is quite different, being much larger in vault size and in facial dimensions as well. The Cypriotes notably lack the heavy mandible of western European brachycephals.

The position of the Cypriotes in the modern racial scheme falls into the brachycephalic group of moderate vault size, including Alpines, Armenoids, and Dinarics; the most notable feature is the small face, notable for its narrowness, and the light jaw. It is more like the modern Dinarics than anything else, since it diverges from the Armenian standard in the same way as do modern Albanians. The stature [12] was tall, as with modern Dinarics, and the long bones slender. The brachycephalic people who entered the Anatolian—Eastern Mediterranean region in the latter part of the third millennium B.C. were, therefore, an early form of Dinaric; as, one suspects, were the so-called "Armenoids" who came into Mesopotamia at the same time. This is our first meeting with the Dinaric race. Its appearance in western Asia seems quite abrupt, but was probably the result of a gradual development, followed by an overflow or evacuation from the seat of its characterization. Where this may have been is still unknown.

Nevertheless, we may eliminate a number of possibilities. It did not come from Egypt or Mesopotamia, and it could not have come from the northern steppes, which were occupied by dolichocephals. Its place of origin was probably not far from Cyprus. Despite the Anatolian evidence, it may have developed somewhere in the highlands of Asia Minor or in the mountains of Syria, for it is especially numerous in both these places today.

It could not, presumably, have been an unreduced and unmixed Upper Palaeolithic survival. It lacks the size of vault, the width of face, and the lowness of orbit which characterize all groups so derived. In face and nose form and in size, it resembles the common Mediterranean types of Asia Minor, Mesopotamia, and the Irano-Afghan plateau. It may, therefore, have been a local and specialized Near Eastern form, brachycephalized by some agency and mechanism which will be explained later.[13] From its point of dispersal at the eastern end of the Mediterranean, it spread by sea into far distant lands.

(3) THE MINOANS

The earliest land to receive metal which is considered part of Europe was Crete, and there the Bronze Age Minoan civilization began a century

[12] Mean for 13 males = 168 cm.

[13] The biological status and origin of the Dinaric race will be explained in the chapters on the living, particularly in Chapter VIII, Section 6, and Chapter XII, Sections 11, 12, and 17.

or two before 3000 B.C. Crete had been occupied in earlier times by Neolithic peoples, of whom unfortunately no physical traces remain. The Metal Age was introduced by immigrants from two directions—from the Egyptian Delta, about the time that Menes was extending his power northward, and from the mainland of Asia, presumably from Palestine. The Cretan manner of metal-working was largely of Asiatic rather than of Egyptian inspiration.[14]

Although Neolithic remains are absent, the Minoan Age is represented by one hundred and more skulls, and a smaller number of long bones,[15] as well as a considerable body of very realistic fresco painting and sculpture in the round.

The Cretan skulls found at various sites on the island belong to a fairly uniform type; this is a small Mediterranean variety with a mean cranial index of about 72. Metrically, they could fit perfectly into a number of Egyptian collections, from the Naqada predynastic to the Middle Empire. On the whole, these Cretan crania are a little smaller, shorter-faced, and less leptorrhine than the majority of the Egyptian series, and show leanings in the direction of the Copper Age skulls from Alishar, and the Early Bronze Age ones from Palestine. The mean type was somewhere between Danubian, Cappadocian, and Egyptian forms.

That this was a short-statured variety of Mediterranean race is shown by the long bones; local means vary from 156 to 162 cm. Hence, the Cretans were shorter than the Egyptians as well as lower faced. The bodily build of the Cretans is well known from fresco painting and sculpture; the local ideal of a small waist and wiry, light, but vigorous musculature, which occurs so constantly in the Minoan art, must have been based to a large extent on reality. Nevertheless, there was a variant minority with broad bodies, and, in the women, large breasts;[16] this departure from the usual Mediterranean form was also seen in Egypt, and does not necessarily imply the presence of an alien race.

The Minoans were prevailingly brunet in hair and eye color, but in Late Minoan times, at least, blondism was known, but apparently not common.[17] The skin is represented by Minoan painters as a deep terra cotta for men, and white for women. This exaggerates the difference between outdoor and indoor habits of life. It again reflects Egyptian influence. The

[14] Childe, V. G., *The Bronze Age*, pp. 19–20.
[15] Evans, Sir A., *Palace of Minos at Knossus*, vol. 1, pp. 7–13.
Duckworth, W. L. H., **ARBS**, vol. 9, 1902–03, pp. 344–355.
Hawes, C. H., and H. B., *Crete, the Forerunner of Greece*, pp. 23–26.
Luschan, E. von, **ZFE**, vol. 45, 1913, pp. 307–393.
Rosinski, B., **Kosmos**, vol. 50, 1925, pp. 584–637.
Sergi, G., **AJA**, second ser., vol. 5, 1901, pp. 315–318.
[16] Myres, J. L., *Who Were The Greeks?* pp. 74–76.
[17] Myres, J. L., *op. cit.*, pp. 198–199.

Egyptians, however, rarely colored the wall paintings of their women purely white; except in the case of goddesses and such rare mortals as Hetep Heres II, the usual color is a pinkish yellow.

The facial features of the Cretans, if one discounts the conventions of the artists, were purely Mediterranean; the straight, prominent nose, with its high root, the smooth profile of the forehead, and the lightness of the mandible are all clearly shown. The hair form is wavy or lightly curled, and the beard, usually clean shaven, was apparently scanty. A variant racial type, which may indicate an Alpine element similar to that found in Greece (see following section), is seen in a broad-faced form, associated with a lateral bodily habitus, and an occasional snub nose. Although the physical type of the Cretans has changed somewhat since the fall of the Minoan power, the features of the happy and athletic people shown on the frescoes at Knossus, and the preoccupied frown of the snake goddess, are still familiar to us, for they reflect the common heritage of the Mediterranean race elsewhere.

Most of the Early Minoan skulls belong to the Mediterranean type just described, which shows a blending between the usual Neolithic variety and the convex-nosed type prevalent in the Near East. In some sites, as at Hagios Nikolas and Patema, the population was exclusively Mediterranean. In others, a few brachycephalic examples occur, and these apparently belong to the same type found at Cyprus.

In the later Minoan periods the brachycephals increased in numbers, but never formed more than a minor element in the population, probably not more than a sixth at most. Since 70 per cent of the population of Cyprus may have belonged to this type, the Cretans must have kept themselves fairly free from eastern admixture after the initial establishment of their national culture and power. At the time of the Dorian invasions, as today, the Cretans were still predominantly Mediterranean.

Toward the end of the Early Minoan period, somewhat before 2100 B.C., strong Cycladic influences entered Crete, and it is possible that some of the Middle and Late Minoan skulls of unusual size and Megalithic conformation may be derived from this movement. The present population of Crete belongs largely to a tall Mediterranean type, which may partially antedate the Dorian arrival.[18]

(4) THE GREEKS

The question of the origin of the Greeks has long been an apparently insoluble enigma. For centuries, before the development of archaeology

[18] Our data on which is based the assumption that all Cretans were of short stature are not numerous. The Philistines, presumably Cretan relatives in Palestine, are thought to have been tall, while some of the Mycenaeans in Greece were of large stature.

as a scientific discipline, history began with Herodotus, and Homer was a small window permitting tantalizing glimpses into the most distant past. In recent years, however, great advances have been made toward the solution of this problem, by the linguistic and historical researches of Myres,[19] and by the publication of skeletal material by Fürst and Koumaris.

The historical reconstruction may be briefly summarized as follows: During the Neolithic, Greece was culturally connected with North Africa and the rest of the Mediterranean basin. The one skull which is known is of normal Mediterranean racial type. In the early Metal Age, immigrants from the Cycladic islands, of Asia Minor origin, introduced copper to Greece, with the mother goddess cult, and settled on either side of the Isthmus of Corinth. In the meanwhile, Painted Pottery people of Danubian cultural origin came down to Greece from the north, driven by Corded people. Thus, by 2000 B.C., there were, from the cultural standpoint, three elements in the Greek population: (a) local Neolithic Mediterranean; (b) Danubian from the north; (c) Cycladic people of eventual Asia Minor origin.

Between 2000 B.C. and the period of Homer, Greece was invaded three times more; (a) by Corded people (Myres calls them "Kurgan" people), who came from the north about 1900 B.C., and who, Myres thinks,[20] may have brought the Indo-European basis of Hellenic speech; (b) by Minoans from Crete, who founded the "long genealogies"; dynasties of rulers at Thebes, Athens, Mycenae, and elsewhere. Most of these entered Greece about 1400 B.C., although some may have dated back to 1700 B.C.; (c) by "divine born" foreigners, such as Atreus, Pelops, etc., who came from across the Aegean in ships, learned Greek, usurped thrones, and married the daughters of the kings of Minoan ancestry.

These foreigners, whom Myres likens to the Normans in English history, begat the heroes of the Trojan war. The war itself reflects the close relationship between these adventurers and Priam's Troy. In the wars, the Homeric heroes formed the nuclei of small groups of "companions"; these were homeless adventurers, refugees, and poor relatives, who had attached themselves to the heroes in a close personal bond. The bulk of the Greek army was composed of local conscripts from the various kingdoms of Greece, who were of a different ethnic origin and who, like Thersites, had no especial interest in destroying Troy.

The post-Homeric and Iron Age Dorians, long regarded as fresh invaders from the north were, according to Myres's reconstruction, but

[19] Myres, J. L., *op. cit.*, 1930.

[20] In view of evidence to be presented later, it is more likely that the Danubians brought it (Chapter VI).

Greek speakers who had been isolated in the Mt. Olympus region by the warlike activities of the Thebans, and who had obtained iron from Asia Minor.

The Greeks of the great period of Athenian civilization were thus the product of much mixture from diverse ethnic sources, as the study of the origin of the Greek language also reveals.

The skeletal record can, in part, supplement the evidence of reconstructed history. Six skulls from Hagias Kosmas near Athens represent the period of amalgamation of Neolithic Mediterranean, Danubian, and Cycladic elements, between 2500 and 2200 B.C.[21] Three are dolichocephalic, one mesocephalic, and two brachycephalic. The faces of all are narrow, the noses leptorrhine, the orbits high. One may conclude that a Cretan type of Mediterranean and the Cypriote Dinaric form were both present.

Twenty-five Mid-Helladic crania represent the period after the arrival of the Corded or "Kurgan" folk from the north, and during the seizure of power by the Minoan conquerors from Crete.[22] Of these, twenty-three come from Asine, and two from Mycenae. Needless to say, the population of this time was very mixed. Only two skulls are brachycephalic; they are both male, and both associated with very short stature. One is of medium size, high-vaulted, and narrow-nosed and narrow-faced; the other extremely broad-faced and chamaerrhine. They seem to represent two different broad-headed types, both of which can probably be found in Greece today.

The long heads are not of uniform type; some, with large vaults and strong browridges, with deep nasion depressions, remind one of the larger varieties of Neolithic dolichocephals, of both Long Barrow and Corded types; and Fürst feels that a number of them are very similar to the Late Neolithic crania from Scandinavia, of about equal age. Needless to say, both Corded and Megalithic people were present in Denmark and Sweden at about this time.

The rest of the long-headed crania, which are probably more truly representative of the bulk of the Mid-Helladic population, are of the slight-browed, high-nosed type familiar in Crete and Asia Minor during the same epoch. They, too, are short statured, while the few examples of the larger-headed variety are, as is expected, taller. It is impossible, with present data, to isolate from the main body of these crania a Danubian type, although the latter may well have been present.

Forty-one Late Helladic skulls, dated between 1500 and 1200 B.C., and coming likewise from Argolis, may include those of some of the "divine-

[21] Koumaris, J., **RA,** vol. 44, 1934, pp. 248–251.
[22] Fürst, C. M., **LUA,** N. F., vol. 26, #8, 1930; **VHPA,** vol. 4, 1930, pp. 3–14.

born" invaders. Among these, one-fifth are brachycephalic, and apparently largely of the Cypriote Dinaric type. Of the long-headed skulls, a large number belongs now to the larger, more heavily marked varieties, and fewer to the smaller Mediterranean. The similarity to the northern types, and especially to the Corded, is even stronger than before. This increase in a non-Minoan direction may perhaps be attributed to the arrival of the ancestors of Homer's heroes.

This survey carries us through the Bronze Age. The racial history of Greece in full classical time is not as well documented as that of the periods just studied. Until the inception of the slave trade [23] in Athens and other centers of manufacture and export, there can, however, have been little population change. In Argolis, the Mediterranean racial element is the only one clearly shown in six proto-geometric and "Hellenic" crania.[24] According to Koumaris's compilation of cranial indices,[25] mesocephaly reigned everywhere in Greece during the classical period, and into Hellenistic and Roman times. The mean index for Athens in the great period was 75.6, on 30 crania. This mesocephaly probably conceals the presence of a varied racial amalgam, with Mediterranean strains predominant. The Greek colonies in Asia Minor show much the same combination of types which we have seen in Greece itself.[26] Mixture with Asiatics must have been masked by the essential racial similarity of the populations on either side of the Aegean.

Greek literature and Greek art furnish an abundance of evidence as to the pigmentation and the characteristic facial features of the ancient inhabitants of Hellas. The Olympian gods, ancestors of the semi-divine heroes, were for the most part blond, with ivory skins and golden hair. Athene was gray eyed. Poseidon, however, was black haired. These gods were little different, if we may believe Homer, from their descendants the heroes, most of whom were white limbed and golden haired.[27]

Odysseus's herald Eurybates was dark skinned and curly haired; Achilles's son Neoptolemos, perhaps by a brunet mother, was rufous. The Spartans were said to be blond, and in fifth-century Athens women bleached their hair with an herb which turned it golden yellow, in pursuance of a blond ideal. Vase painters of the sixth to fourth centuries were able to distinguish blond and brunet color by conventional glazes, and

[23] Zaborowski, S., **ARSI** for 1912, 1913, pp. 597–608.
[24] Fürst, C. M., **LUA,** vol. 26, #8, 1930, pp. 92–95.
[25] Koumaris, J., **ACAP,** 1931, pp. 218 seq.
[26] Schumacher, O., **ZFMA,** vol. 25, 1926, pp. 435–463.
Zaborowski, S., **BSAP,** ser. 4, vol. 3, 1881, pp. 234–238.
[27] Myres has conclusively demonstrated that the much disputed word ξανθός actually did mean "yellowish" or "sandy." Pp. 192–194.

applied this distinction to representations of living models as well as of heroes.

Greek terminology included words for blue and brown eyes, and for green ones, the color of an olive leaf, as well; in skin color it recognized rosy vascularity, a pallid hue resembling cream cheese or the skin of unripe apples, a honey color, and a deep brunet. To Phoenician merchants and tanned sailors of other nationalities, they gave the name "phoinix," comparable to the color of a ripe date, or a bay horse. Thus within the Greek commonwealth as without it, all variations of pigmentation known to modern Europeans were probably to be found.

The Minoan convention of a high-rooted nose and a lithe body passed over into classical Greece as an artistic ideal, but the portrait busts of individuals show that it cannot have been common in life. Villains, comical characters, satyrs, centaurs, giants, and all unpleasant people and those not to be admired, are often shown in sculpture and in vase painting as broad-faced, snub-nosed, and heavily bearded. Socrates, who belonged to this type, was maliciously compared to a satyr. This type may still be found in Greece, and is an ordinary Alpine. In the early skeletal remains it is represented by some of the brachycephalic crania.

On the whole, one is impressed, after looking at the portrait busts of Athenians, and the clay masks of Spartans, with their resemblance to present-day western Europeans. This resemblance becomes less marked in the art of the Byzantines, however, where modern near Eastern faces are more frequent; but the Byzantines lived mostly outside of Greece. As will be shown later (Chapter XII, section 14), the modern inhabitants of Greece itself differ surprisingly little from their classical predecessors.

(5) COPPER AND BRONZE IN THE WESTERN MEDITERRANEAN

In early Metal Age times influences from Crete and the Aegean, including those from the second city of Troy, spread westward to Sicily, Sardinia, Italy, and Spain, reaching also the smaller islands of the western Mediterranean. This maritime diffusion was probably carried by seafarers in search of new sources of metal as well as markets for their products, and the traders and adventurers followed the old Megalithic routes. In the beginning the bringers of metal and the Late Megalithic colonists may well have been the same people.

The evidence of the racial composition of the Copper Age sailors who reached Italy and the Italian islands is simple and direct. The moderately tall, long-headed, and narrow-nosed Megalithic people who were implanted, during the Late Neolithic, upon the smaller Mediterranean type which had preceded them, were followed, during the Aeneolithic, by others of the same kind, in the company of equally tall brachycephals. The latter

resembled the people of the same Dinaric head form in Cyprus, Crete, and the Aegean, and without doubt formed a westward extension of the same movement.

In Sicily, which probably received metal earlier than most of the mainland or the islands farther west, Copper Age skulls of one series from Isnello [28] are all of general Mediterranean type, with the Megalithic variety predominant, as shown by excessive skull lengths, moderate vault heights, and narrow noses. The mean stature for twenty-four males, presumably of this type, was 169 cm. Other Sicilian series, however, do include brachycephals, as at Chiusella and Villafratti, with cranial indices ranging as high as 91.[29] These form, however, no more than one-third of the total Aeneolithic series from Sicily. In the true Bronze Age which followed, the incidence of these brachycephals increased.

In Sardinia a large series of sixty-three Copper Age skulls from Anghelu Ruju [30] includes sixteen per cent, or ten individuals, of the new brachycephalic type, while the others resemble the long heads of Sicily. The group as a whole, irrespective of head form, was tall.[31] The racial composition of Corsica during these periods is known only through the presence of one small, short-statured, long-headed female skeleton of either Neolithic or Aeneolithic age, and two brachycephalic crania from the Bronze Age.[32]

It would be interesting to supplement this survey of the Italian islands with a study of the crania found in the elaborate burial chambers of Malta, of late Neolithic or early Metal Age date, but the excavators of these vaults, professional and otherwise, literally threw away what was probably the longest unified series of human crania ever found, numbering over seven thousand. We are told that these early Maltese were "Mediterraneans," and know little else about them.[33]

On the mainland of Italy, Aeneolithic skeletons, which are found mostly on the western side of the central portion of the peninsula, belong to the same types found on the islands, but brachycephals are more abundant, being equal in number to the dolicho- and mesocephals.[34] Some of the Aeneolithic Italians of the Campagna and of Latium were very tall and large headed, with both mesocephalic and brachycephalic forms.[35] In

[28] Giuffrida Ruggeri, V., **ASRA,** vol. 11, 1905, pp. 56–103.
Zaborowski, S., **BMSA,** ser. 5, vol. 6, 1905, pp. 196–199.
[29] Sergi, G., *Crani Preistorici della Sicilia; Europa,* pp. 270–289.
[30] Sergi, G., *Crani Antichi della Sardegna.*
[31] Bruni, E., **RDAR,** vol. 26, 1924–25, pp. 235–250.
[32] Bloch, A., **BSAP,** ser. 5, vol. 3, 1902, pp. 333–363.
[33] Tagliaferro, N., **Man,** vol. 11, 1911, pp. 147–150.
[34] Sabatini, A., **RDAR,** vol. 29, 1930–32; pp. 577–582.
Sergi, *Europa, loc. cit.*
Mochi, A., **APA,** vol. 42, 1912, pp. 330–347.
[35] Genna, G. E., **PICP,** 1932, pp. 60–64; **RDAR,** vol. 30, 1933–34, pp. 235–262.

Istria, at the head of the Adriatic, the Dinaric population which is dominant in that peninsula today had begun to arrive in the Copper and Bronze Ages,[36] judging by a series of six female crania which bear definite indications of this type, such as flattening of the occiput, narrow face, and projecting nasal bones. The new invaders may, therefore, have travelled up the Adriatic as well as over the Tyrrhenian Sea.[37]

Reviewing the Italian material, on both metrical and morphological grounds we may determine that the round-headed racial type which came into the middle Mediterranean with the introduction of metal was of a general Dinaric character, and without doubt came from Asia Minor and the Aegean, where it first appeared in the last centuries of the third millennium B.C. Since the metal ages of the middle and western Mediterranean were later than those farther east, the chronological aspect of this theory presents no contradictions.

The Balearic Islands, Spain, and Portugal were, of course, the next stops in the westward spread of the metal-carrying seafarers through the Mediterranean. During the Early Copper Age in Spain, the distinctive Bell Beaker culture arose, which was soon to spread northward and eastward into central Europe, and eventually to Britain, as an important racial movement; and another culture of equal local importance, that of Los Millares in Almería, developed from eastern beginnings, with an emphasis on the importation of Egyptian and Near Eastern materials, such as hippopotamus ivory, ostrich egg shells, and actual Near Eastern pottery.[38] The center of Early Bronze Age civilization again lay in Almería, with el Argar as the principal site, and began about 2000 B.C. During this period, which lasted until the Iron Age, there was again much Egyptian and Aegean influence.

Unfortunately, in the Iberian Peninsula, as elsewhere, the human record is not sufficient to support the complexity of the cultural. The craniologist cannot keep pace with the archaeologist; we cannot, without more numerous and more accurately correlated skeletons, tell in all cases what physical types went with each archaeological entity.

In the Balearic Islands, for a beginning, a few dolichocephalic crania, and one brachycephal, have been found in the *talayots*, or corbelled stone towers resembling the Sardinian *nuraghes* and Scottish brochs, which were first built in the Copper Age but which were used until the advent of iron.[39] Fifty-eight adult and five juvenile crania with long bones from a

[36] Battaglia, R., **PICP**, 1932, pp. 57–60.
[37] Unless these particular Dinarics came overland from central Europe.
[38] Childe, *The Bronze Age*, pp. 146–153.
[39] Aranzadi, T. de, **BAC**, vol. 1, 1923, pp. 134–140.
Cameron, John, *The Skeleton of British Neolithic Man.*
Comas, Juan, *Aportaciones al Estudio de la Prehistoria de Menorca.*

naveta, or long barrow, in Menorca, are said to have represented a homogeneous group of people with short stature, long-heads (all cranial indices being under 75), low faces, prominent, aquiline noses, and projecting chins. The form of the scapulae and humeri of the males showed that they had developed great shoulder and arm muscles from slinging, the activity from which the islands derived their name. Three other skulls from an ossuary at Biniatap are brachycephalic.[40]

In the Copper Age groups from mainland Spain and Portugal, the old long-headed types overwhelmingly prevail: out of one hundred and thirty-four crania, which represent all that could be assembled for this survey, only fifteen, or nine per cent, were brachycephalic.[41] If one includes Ariège, Basses Pyrenees, and Aveyron in the south of France, twenty-eight crania may be added, of which only two are brachycephalic.[42] One of these, from a site near the city of Narbonne, possesses all of the cranial and facial features typical of the Bronze Age brachycephals of Cyprus, Italy, and the Italian islands. In few of the Spanish instances are extensive details given, but it is probable that the brachycephalic crania there are also of the same type.

Many of the dolichocephalic Copper Age skulls are of Megalithic or Long Barrow type, while others are of a smaller, less rugged, Mesolithic or Neolithic Mediterranean variety. Among the mesocephalic crania, some may again be small Mediterraneans, while others, with larger vault dimensions, may in many instances be mixtures between Megalithic and brachycephalic types. The statures of the large dolichocephalic group average about 167 or 168 cm.; taller than most living Spaniards and as tall as the Neolithic Long Barrow population in Britain. Other dolichocephalic crania go with short stature, with a mean of about 160 cm. Unfortunately, it is not possible to determine the approximate proportions of Megalithic and Mediterranean types, but the former seem to be at least one-half of the total.

A special development of the Copper Age in Spain was the Bell Beaker culture, about which more will be said later, since its chief influence in the racial sense fell upon areas in other parts of Europe. It is at present the general belief of archaeologists that the Bell Beaker culture arose in central

[40] Cameron, John, **PICP**, 1932, p. 60.

[41] Aguilo, Juan C., **AMSE**, vol. 1, 1922, pp. 23–36.
Aranzadi, T. de, **BAC**, vol. 3, 1925, pp. 177–206.
Barras de Aragon, F. de las, **AMSE**, vol. 12, 1933, pp. 90–123; vol. 9, 1930, pp. 59–64.
Batista i Roca, J. M., **BAC**, vol. 1, 1923, pp. 104–133.
Mendes-Correa, A. A., *Os Povos Primitivos da Lusitania.*
Tormo, I. Ballester, **APL**, vol. 1, 1928, pp. 44–53.

[42] Héléna, Th. and Ph., **BAC**, vol. 3, 1925, pp. 1–35.
Lapouge, G. V. de, **Anth**, vol. 2, 1891, pp. 681–695.
Vallois, H., **Anth**, vol. 37, 1927, pp. 277–303, 473–489.

Spain, shortly before 2000 B.C., from local beginnings.[43] A North African origin is rendered unlikely by the supposed absence of a Bronze Age south of Gibraltar, although recent work in Morocco has revealed some supposedly early metal.[44] Where Bell Beaker burials are found in central Europe, the skeletons are almost always of the same tall brachycephalic type which we have already studied in the eastern Mediterranean and Italy. In Spain, however, they are frequently of the Megalithic race. The basis for the belief that the Bell Beaker people of Spain were Dinarics rests largely upon three cranial fragments from the type site of this culture at Ciempozuelos, near Madrid, and upon one complete mesocephalic skull from Cerro de Tomillo some forty miles away.[45]

The measurements of the three fragments are uncertain, and their allocation to a definite type impossible.[46] However, all three fragments appear to be brachycephalic, and one to have a high vault. One has strong, another weak, browridges. One seems to have a slight lambdoid flattening. In the only fragment which possesses facial bones, the orbits are high and the nose narrow. The Cerro de Tomillo skull is not, however, a pure dolichocephal, and does resemble, in a partial sense, the Dinaric brachycephalic variety which was common in the Mediterranean at that time.

Although there seems to be little doubt in the minds of the archaeologists that the Bell Beaker culture developed in Spain, and although eastern Mediterranean brachycephals came there at about the same time, the manner in which the physical type and the culture became identified with each other is still obscure.

During the Early Bronze Age, after the efflorescence of the Bell Beaker people, Spain became a great center of metallurgy and trading activity, rivalling the Aegean in importance. The colonists from the east, who had originally located themselves in Spain merely as miners and forwarding agents of metal, now settled down to producing the finished products of the Bronze Age in Spain itself, for local sale, since disorders in the Mycenaean and Minoan realms had apparently cut them off from their homelands.[47] Furthermore, the introduction of fresh cultural elements from the east suggests that new people had joined them.

The principal site of the Early Bronze Age, el Argar in the province of Almeria, is located near the silver mines of Herrerias, which were worked in ancient times. From some thirteen hundred flexed urn burials, seventy

[43] Bosch-Gimpera, P., **Real**, vol. 4, pp. 345–362.
[44] Ruhlman, A., **Hespéris**, vol. 15, 1932, No. 1, pp. 79–119.
[45] Childe, *The Danube in Prehistory*, Chapter X, pp. 190–201.
[46] Anton, M., **BRAH**, vol. 30, 1897, pp. 267–283.
Deslaers, M. H., **BRAH**, vol. 71, 1917, pp. 18–38.
[47] Childe, *The Bronze Age*, p. 146.

skulls have been recovered, of which twenty-nine are those of adult males, and forty of adult females.[48] The el Argar series shows quite definitely that the Early Bronze Age people of Almeria were not descendants of previous inhabitants, but to a large extent a new population, with definite Near Eastern relationships, as one might suppose from the cultural indications.

The series as a whole is one of small people, with a mean male stature of 158 to 160 cm.; the earlier Copper Age immigrants, for the most part, were ten centimeters taller. The skulls gravitate around the indices of 76 and 77; for sixty per cent of male and fifty-eight per cent of female crania are mesocephalic. Of the remaining skulls, long heads outnumber round heads two to one. The series is not very homogeneous, and the cranial index and most other criteria of form show modalities which make it certain that the el Argar people included at least two types which had not become completely amalgamated.

The principal cranial element is a normal, rather small variety of Mediterranean, which seems to resemble, both metrically and in description, predynastic or early dynastic Egyptian forms, or at the same time, elements which entered Spain in the Neolithic. Prominence of the brow-ridges at glabella, and a considerable nasion depression, make this type of Mediterranean rather unlike the Cappadocian variety common in Asia Minor, although metrically there is nothing to prevent such a relationship.

The second type is the new brachycephalic element, which seems to have been the dominant one politically, in that two female skulls found wearing silver crowns both belonged to it. It was apparently some form of Near Eastern brachycephal with which we are already in a general way familiar—the skull is short, rather than broad; the vault is medium or low; the forehead is narrow, the lambdoid region often flattened, while the greatest breadth of the vault comes well to the rear. The nose is high and narrow, and the nasal bones join the frontal with little depression, while a smooth glabella heightens the impression of a high-bridged, Near Eastern type of nose. Although the orbits are high and rounded, the face is rather low, but the mandible is surprisingly broad, often with everted gonial angles. There is also a perceptible amount of alveolar prognathism.

Although this is not exactly the brachycephalic type which we met in the Copper Age, and which became identified with the Bell Beaker people, it is, nevertheless, definitely a Near Eastern variety of brachycephal which is familiar in Asia Minor and Syria today. The el Argar people represent a mixture of elements which could be duplicated in the modern Near East, but not one with which, in our ignorance of most of that end of the

[48] Jacques, V., **BSAB**, vol. 6, 1887–88, pp. 210–236.

Mediterranean, we are already familiar. Some of the Mediterranean racial contingent may well have been of earlier Spanish derivation, but if so the absence of Megalithic and Copper Age forms is surprising.

In other parts of Spain no such change of population as that of Almeria is manifest. Mediterraneans, both large and small, are carried over from the Neolithic and Copper Ages, while the larger variety of brachycephal also continues.[49] Out in Mallorca and Menorca, the dolichocephalic element seems to remain as the exclusive or predominant one, for the most part tall and of Long Barrow vault form.[50]

The westward migrations of peoples from the Aegean and the eastern end of the Mediterranean, during the Late Neolithic, the Aeneolithic, and the Early Bronze Age, must have affected the populations of Italy, Sicily, Sardinia, Corsica, the Balearics, and the Iberian Peninsula to a considerable degree. These were real colonizations which added new racial elements to the Mesolithic and Early Neolithic Mediterranean sub-stratum. By the middle of the Bronze Age, the central and western Mediterranean lands had assumed the racial characteristics which they still, for the most part, bear. Except for northern and central Italy, later migrations were to bring little that was new.

(6) BASQUES, PHOENICIANS, AND ETRUSCANS

Since the western Mediterranean lands have changed little racially since the end of the Bronze Age, it may perhaps be forgiven us if we break the continuity of the present chapter, as was done earlier in the cases of Mesopotamia, Egypt, and Greece, to discuss, at this point, the origins and racial characteristics of certain non-Indo-European-speaking peoples who are or were in later times known by specific names—the Basques, the Phoenicians (as Carthaginians), and the Etruscans.

In regard to the Basques, it has been observed that the skeletons from dolmens of Guipuzcoa, probably of Early Metal Age, resemble those of the modern Euskarians of the same province, in stature, in head size and form, and in characteristic facial peculiarities.[51] Since the northern shore of Spain, in the country occupied by the Basques since the beginning of history, is rich in metal ores and was a favorite haunt of Copper and Bronze Age sea migrants, it is very likely that a numerically strong western Asiatic element, including both Megalithic and Dinaric types, became a permanent factor in the local population. When we come to discuss the physical anthropology of living Basques, the probability of such an influence will be of assistance.

[49] Aranzadi, T. de, *Excavacio de Sepulcres Megalitics*, pp. 31–39.
Barras de Aragon, F. de las, various articles in **AMSE**, 1921, 1926, 1930.
[50] Barras de Aragon, F. de las, **AMSE**, vol. 9, 1930, pp. 38–51.
[51] Serra i Vilaro, after Mendes-Correa, 1924.

The second people, the Phoenicians, who established their principal colony at Carthage at the end of the second millennium B.C., and posted trading garrisons at various points on the North African coast, both on the Mediterranean and Atlantic sides, also settled along the eastern coast of Spain, where they founded the city of Cartagena. Except for the Greeks, they formed the last of the groups to migrate westward from the eastern Mediterranean by sea, but the first to do so in full historical light.

The physical type of the Phoenicians is well known from the skeletal remains found in tombs at Carthage.[52] A series of 117 skulls, of which 68 are male, belong for the most part to one characteristic type; dolicho- to mesocephalic, with the cranial index at 75; fairly long vaulted, and hence moderately broad; with a very low vault, a moderately broad forehead, a short face, high orbits, and a narrow, projecting nose which often springs directly from the frontal bone with little or no nasion depression. These skulls are in many ways similar to the Megalithic or Long Barrow type of the preceding millennium; but, as is to be expected in view of their late eastern Mediterranean origin, show modifications toward a shortening and widening of the vault, and a beaking of the nose.

A few related brachycephals, of Dinaric form, are incidental to this type, while a number of less characteristic skulls, with lower orbits and less prominent, wider noses, may be those of North African natives. The Carthaginians were apparently rather tall, with a mean male stature of 168 cm. The Greek evidence, already quoted, indicates that they were brunet.

There can be no doubt that the majority of the Carthaginians who were buried in these tombs were either the descendants of seafarers from Palestine and Syria, or at least immigrants from the east of similar race. Nine skulls of important men, taken from elaborate stone sarcophagi, belong to exactly the same type as the majority of the others, except that these representatives of the privileged classes had larger heads in all or most dimensions than those of the masses. This correlation between size and status, or size and opportunity, is a familiar human trait wherever there are social and nutritional differences, and has no coincident racial significance. Single Phoenician skulls from two points in the western Mediterranean, Melilla in the Moroccan Rif, and Ibiza in Spain,[53] conform exactly to the standard set by the Carthaginians.

The last of the three non-Indo-European speaking ethnic groups, the Etruscan, probably came to Italy as early as the first quarter of the tenth

[52] Bertholon and Chantre, *Récherches Anthropologiques dans La Bérberie Orientale*, pp. 251–266. Also:

Collignon, R., **Anth**, vol. 3, 1892, pp. 163–172.

Mantegazza, P., **APA**, vol. 6, 1876, pp. 17–29.

[53] Barras de Aragon, F. de las, **AMSE**, vol. 9, 1930, pp. 35–64; 79–105.

century B.C. Another wave is said to have arrived in the eighth century. The colonists apparently kept up contacts with their homeland until about 650 B.C. This homeland, according to the classical tradition, maintained by all Greek and Roman historians from Herodotus to Pliny, was Lydia in Asia Minor. That this tradition is accurate is the belief of most modern classical scholars.[54]

The cranial evidence from Etruscan tombs [55] substantiates the belief that these non-Indo-European, non-Semitic speakers were typical examples of the earlier Bronze Age population of the eastern Mediterranean. As with the earlier el Argar people of Spain, a mesocephalic mean for the cranial index covers the presence of pronounced long heads and round heads, with the two extremes, in this case, forming about equal proportions. Actually, the metrical characteristics of the two series are much alike, but the Etruscan skulls were a little larger, which is not surprising, for the el Argar crania were for the most part rather small.

The Etruscan skulls are notably smooth in surface relief, with little in the way of browridges; the side walls of the vaults, seen from above, are not parallel, as with the longer Mediterranean forms, but converging, with the greatest breadth in the parietals and a narrow forehead; the orbits are high and rounded, and the nose narrow. The Etruscans, with a typically Near Eastern cranial form, resemble both the Cappadocian type found in the Hittite period at Alishar, and the planoccipital brachycephals which appeared in the Bronze Age cemeteries of Cyprus. By Roman times these two varieties had blended, to a large extent, into a variable mesocephalic form, to which the Phoenicians as well largely belonged.

It would be difficult to overemphasize the importance of the migrations of eastern Mediterranean peoples by sea to Italy, Spain, and the islands between these two peninsulas in protohistoric as well as in prehistoric times. Especially in Spain and Italy, large numbers of peoples immigrated, who added, to the basic Mediterranean population of Neolithic origin, Near Eastern elements which may still be discerned among Italians and Spaniards today. The debt of the Romans to the Etruscans, genetically as well as culturally, was especially great.

(7) THE COPPER AGE IN EUROPE NORTH OF THE MEDITERRANEAN LANDS: DANUBIAN MOVEMENTS AND BELL BEAKERS

While the earliest Metal Age culture was being carried westward through the Mediterranean by sea, other agencies conveyed it overland into central Europe. As before, the main highroad was the Danube Val-

[54] Schachermeyer, Fritz, *Etruskische Frühgeschichte.*
[55] Sergi, G., **AFA**, vol. 41, 1915, pp. 309–313 ff.

ley, but this time the center of earliest diffusion was not Bohemia, but Hungary. A series of crania from Bodrogkeresztúr in that country [56] are uniformly dolichocephalic, with the highest individual cranial index, out of more than fifty examples, only 76. This is too low for Danubians of the usual Neolithic type, and one suspects a movement from the northeast of peoples of Corded origin. The common presence of copper battle-axes, red ochre, tumulus burials, and other south Russian cultural traits in Copper Age sites in Hungary [57] would tend to confirm this deduction. In the west Corded people brought the first metal to Switzerland, and in this case crania of definitely Corded type are involved.[58]

The inhabitants of Yugoslavia during the Copper Age were, like those of Hungary, also uniformly dolichocephalic.[59] Unfortunately, here also we have no further information of racial significance. As one approaches the mouth of the Danube, however, this dolichocephalic uniformity disappears. Four skulls from Russe, in Bulgaria, include one male of Corded type, a mesocephalic male, and two brachycephalic females.[60]

From this evidence, such as it is, we may deduce that the people who brought copper into the Danube Valley at the close of the Neolithic period came from two centers, southern Russia and the Caucasus, and Anatolia, by way of Troy. The chief carriers were the Corded people or some others equally dolichocephalic, while brachycephals from Asia Minor were of little importance from the racial standpoint.

While Copper Age civilization was thus spreading westward along the Danube and the lands to the north, a countermovement in the form of the Bell Beaker invasion travelled eastward from the Rhine to the Danube, and as far as Poland and Hungary. The remains of these Bell Beaker people occupy single graves or groups of graves, rather than whole cemeteries; they were apparently wandering traders, trafficking in metals, for their gold spirals have been found in Danish graves of the corridor-tomb period. They were thus in all likelihood rivals of the Battle-Axe people in their search for amber.

It is not known how they went from Spain to central Europe. Sporadic finds in France and northern Italy suggest the Rhône-Rhine and the Brenner Pass routes as alternatives.[61] In neither case is the evidence very satisfactory, and neither excludes the other. From the Rhine Valley as a

[56] Bartucz, L., **MAGW**, vol. 57, 1927, pp. 126–130.

[57] Hillebrand, J., **AH**, vol. 4, 1929, pp. 1–51.

[58] Virchow, R., **ZFE**, vol. 17, 1885, p. 288. (2 adult female, and 1 juvenile, skulls from Vinelz).

[59] Županič, N., **RA**, vol. 29, 1919, p. 28.

[60] Drontschilow, K., Mitt. Arch. Inst. Sofia, 1924, pp. 187–201, quoted by Saller, K., **ZFAE**, vol. 77, #5/6, 1925, pp. 515–571.

[61] Childe, *The Danube in Prehistory*, p. 196.

center, Bell Beaker expeditions moved eastward into Bohemia, Austria, Poland, and Hungary; those who took part in these movements were eventually absorbed into the local populations. The Bell Beaker people who remained in the Rhinelands, however, came into intimate contact with the Corded people, who had invaded from the east and northeast, and with the corridor-tomb megalithic population to the north, whose domain extended down into the Netherlands. These three, of which the Bell Beaker element formed perhaps the dominant one, amalgamated to form an Early Bronze Age cultural unit, the so-called Zoned Beaker people, who invaded England and Scotland as the first important carriers of metal.

The Bell Beaker physical type is known to us from sixty or more skulls from scattered burials in Germany, Austria, Poland, Czecho-Slovakia, and Hungary.[62] Of these, about one-third are truly brachycephalic, while the others are, almost without exception, mesocephals. In the Rhine country around Wörms, three-fourths or more of the Bell Beaker crania are brachycephalic; in Austria, one finds an equally high ratio; but in Bohemia and Poland the high brachycephaly becomes less frequent, and at Tököl in Hungary, in a series of ten crania, four are mesocephalic and six are dolichocephalic.[63]

So high is the mesocephalic ratio, and except for Hungary, so infrequent the truly long-headed crania associated with this type, that the mesocephals are clearly one branch of the main type, and not the product of local mixture with long heads. Morphologically, the mesocephals are essentially Bell Beaker.

The series of skulls from the Rhineland, including nine adult males, is the most suitable for comparison (see Appendix I, col. 21). It is identical in the cranial index mean with that of Fürst's forty-four male Bronze Age skulls from Cyprus, which have already been studied, and which have been called Dinaric. The Rhenish crania are a little larger in vault dimensions, and particularly in height; but are almost identical facially. Morphologically, the two groups are also similar, but the Bell Beaker group is more extreme in many ways; the browridges are often heavy, the general ruggedness frequently greater. The faces are characteristically narrow, the orbits medium to high, the nasal skeleton high and aquiline; the occiput frequently flat. The stature for six males reached the high mean of 177 cm.

[62] Bartels, P., **PZ**, vol. 5, 1912, pp. 67–82.
Jankowsky, W., **AAnz**, vol. 8, 1932, pp. 104–115.
Palliardi, J., **WPZ**, vol. 6, 1919, pp. 41–56.
Saller, K., **ZFAE**, vol. 77, #5/6, 1925, pp. 515–571.
Schliz, A., **AFA**, vol. 35, 1908, pp. 239–267.
Sedlaczek-Komorowski, L., **BAPS**, ser. B, vol. 2, 1932, pp. 253–257.
Stocky, A., and Matiegka, J., **AnthPr**, vol. 3, #2, 1925, pp. 138–155.
Trauwitz-Hellwig, J. von, **MAGW**, vol. 53, 1923, pp. 251–265.
[63] Bartucz, L., **MAGW**, vol. 57, 1927, p. 128.

The deviation of the Rhenish Bell Beaker skulls, such as it is, from the Aegean and eastern Mediterranean Dinaric form, lies in a Borreby direction. It is, therefore, more than likely that the invaders mixed with the descendants of the earlier Neolithic brachycephals, whose territory stretched along the North Sea coast from southern Sweden to Belgium. On the whole, however, at the period represented by the Wörms crania, the eastern or Dinaric element was the more important.

The Spanish Bell Beaker problem now stands in a somewhat clearer light than before. The Dinaric type, with which the Rhenish Bell beakers are associated, is one which entered the western Mediterranean by sea from the east, and eventually moved, by some route yet to be determined in an accurate manner, to the north, and eventually to central Europe. The paucity of brachycephals in Spain may be due to the paucity of remains of this culture in general. It is still possible, one might add, that certain North African elements became involved in the Bell Beaker racial type, but such an accretion is unnecessary and hardly likely.

The Bell Beaker people were probably the first intrusive brachycephals to enter the Austrian Alps, and the mountains of northeastern Bohemia, for the push of Lake Dwelling Alpines southeastward toward the Balkans happened later in the Bronze Age. It is, therefore, possible that the present Dinaric populations of the Dinaric Alps and the Carpathians may be derived in part from this eastward invasion. The small numbers and scattered burial habits of the Bell Beaker people on the more densely populated plains of Europe must have made them of much less ethnic importance there than in the mountains.

In their Rhineland center, the more numerous Bell Beaker people had constant relationships with the inhabitants of Denmark, who were still burying in corridor tombs. Furthermore, the Corded people, one branch of whom invaded Jutland and introduced the single-grave type of burial, also migrated to the Rhine Valley, and here amalgamated themselves with the Bell Beaker people, who were already in process of mixing with their Borreby type neighbors. The result of this triple fusion was a great expansion, and a population overflow down the Rhine, in the direction of Britain.

(8) THE BRONZE AGE IN BRITAIN

The consideration of the Bell Beaker problem leads naturally to that of the Bronze Age in the British Isles, where the Beaker people found their most important and most lasting home. Coming down the Rhine and out into the North Sea, they invaded the whole eastern coast of England and of Scotland, and also the shore of the Channel.

The Beaker invasion of Britain was not a simple affair. Not only did the

newcomers land in many places, but they brought with them somewhat different traditions. Although most of them brought zoned beakers and battle axes, in consequence of their blending with the Corded people in the Rhinelands, others, with the older type of bell beakers and with stone wrist-guards of Spanish inspiration, seem to have entered unaffected by Corded influence.

Like their predecessors the Long Barrow people, the new invaders who went to England chose open lands for settlement, and eschewed the forest of the Midlands, and the Weald of Surrey, Sussex, and Kent. Yorkshire with its moors was a favorite spot, while other centers were Wiltshire and Gloucestershire in the south, and Derbyshire and Staffordshire in between.[64] On the whole, the Beaker people chose the same regions which had attracted the builders of the long barrows, except that the concentration in Yorkshire was an innovation. The Beaker people did not exterminate the Long Barrow people, who continued for a while to build their characteristic earth-covered vaults, in some of which Beaker pots have actually been found. The remains of the newcomers, however, are always buried singly under round barrows, of a type which the Corded people contributed to the Zoned Beaker complex.

In comparison with the Continent, Great Britain contains a great plenty of Beaker skeletal material. The invasions which reached this island brought the wholesale migration of a large population. Over two hundred and sixty crania from England alone have been preserved and studied. Out of a series of one hundred and fifty exhaustively analyzed by Morant, the brachycephals exceed the pure long heads in the ratio of three to one, while the intermediate forms are about equal in number to the latter. This segregation would indicate that the blending between the Corded racial element and its round-headed companions was incomplete at the time of invasion, as well as afterward. In all the regions from which a considerable number of skulls have been taken, the proportion between round heads and long heads is constant, and this would indicate that the survivors of the Long Barrow people were not buried in the tombs of the invaders.

The Bronze Age people of England, as represented by this Beaker series, were clearly heterogeneous. The three ancestral elements which met in the Rhinelands may be distinguished easily. All three were tall, and the mean stature of the whole group was about 174 cm.[65] The Corded element, however, was the tallest, and the Borreby element, about 170 cm., the shortest. On the whole, the heavy-boned, rugged quality of the

[64] Morant, G. M., **Biometrika**, vol. 18, 1926, pp. 56–98.

[65] Obtained by applying Pearson's formula to 27 adult male femora listed by Thurman. Thurman, J., **MASL**, vol. 1, 1865, pp. 120–168, 459–519; vol. 3, 1867, pp. 41–80.

Borreby type seems to have influenced the bodily build of the total group.

The Beaker skulls as a whole are large, long, and high vaulted, whatever their shape. They form one of the rare groups in the world with a cranial length of 184 mm. and an index of over 80. This peculiarity they share with the few known brachycephalic crania of the Upper Palaeolithic. Again reminiscent of Upper Palaeolithic skulls is the ruggedness of muscular markings, the prominence of browridges and occipital lines, and the depth and breadth of the mandible.

In the *Crania Britannica* are engravings of seventy-three male crania of this group; by observing them morphologically it is possible to segregate them into their component elements. Twenty-four, or one-third of the whole, are planoccipital. This ratio is probably about the correct proportion of the original Bell Beaker element in the blend, with the Corded group one-fourth, and the rest Borreby. The planoccipital skulls are, as one would expect, the most brachycephalic; for over sixty per cent of all crania over the index point 83 possess some posterior flattening.

When seriated by index groups and occipital form, the planoccipital brachycephalic male crania (see Appendix I, col. 22) approach metrically the series already discussed from Wörms, as well as that from Bronze Age Cyprus. The British planoccipitals are larger vaulted, in all three dimensions, than their continental and Near Eastern prototypes; they are also wider faced; but in total and upper face heights and in nasal dimensions, they are much the same. The curvoccipital brachycephalic crania (see Appendix I, col. 23) are much larger; and it is this element which contributes the combination of a truly long vault with a high index. They likewise have large faces, of great width, and of great mandibular size. One of the most striking differences between the two brachycephalic British sub-groups lies in the disproportion of face heights. Both have the same upper face height; but the total face height, from nasion to menton, is five mm. greater in the curvoccipital group. The lower jaw of the planoccipital skulls is more nearly of a normal Dinaric form, while that of the Borreby element is nearly equal to Upper Palaeolithic standards.

The dolichocephalic crania (see Appendix I, col. 24), forming the least numerous of the three elements, are of pure Corded type, and furnish an opportunity to study this form in greater numbers than elsewhere. The vault is very long, and extremely high, with a breadth-height ratio of 105, and extremely long faces, with deep, narrow mandibles. There can be no question that these most extreme variants from the fundamental Mediterranean stock came to England as part of the Zoned Beaker racial complex, and do not represent accretions of megalithic Long Barrow survivors, although both elements, in England as in Scandinavia, entered into the ultimate composition of the living population.

In Scotland the progress of events in the Early Bronze Age was quite different from that in England, and more complicated. The Beaker people who arrived on the eastern shore came in part directly from Holland, and in part from England. A few may have approached from the west, by way of Wales. At the time of the Beaker arrival, or not long after it, another group of people, named after the so-called Food Vessels which they placed in their tombs, seem to have arisen in the west, or to have arrived there from Ireland, where they were also prevalent during the Early Bronze Age. These Food Vessel people buried their dead in individual cists, as did the Beaker people, but often incinerated, for which reason their skeletal remains are relatively rare. The two groups—Beaker and Food Vessel—had close relationships and interchanged material possessions and ideas. In many Scottish cist graves, neither type of pottery is present, and it is not always possible to tell to which original complex the burial belongs.[66]

The short cist skeletons of Scotland have been lumped together regardless of original cultural affiliation, which in many cases may have been impossible to determine. By this means a series of seventy-seven crania has been assembled for study.[67] (See Appendix I, col. 25.) In general, the Scottish Short Cist people resembled the Beaker invaders of England, but were by no means identical with them. The means of the cranial dimensions are in many cases smaller, and the larger elements in the blend seem to be less in evidence. Furthermore, the stature seems to have been shorter, with a mean of 165.0 cm.[68] for seventeen males. The group as a whole is more purely Beaker in the continental sense, or Dinaric, than is that in England; metrically, the Scottish series resembles the non-Borreby brachycephalic element in the British Beaker population, and also approximates the skulls from the Rhineland. In several features, such as a lower vault, it comes closer to the Cypriote Bronze Age group than does any wholly Beaker series which we have studied.

The reasons for the difference between the Scottish and English series are not difficult to discover. The Borreby element is less prominent in

[66] Childe, V. G , *The Prehistory of Scotland*, pp. 81–95.

[67] Morant, G. M., and Reid, R. W., **Biometrika**, vols. 3–4, 1928. Later publications, mostly in the **PSAS** series, would swell this number by at least twelve, but would in no way alter the conclusions.

[68] Callander, J. G., **PSAS**, vol. 58, 1924, pp. 23–27.
Callander, J. G., and Low, A., **PSAS**, vol. 64, 1930, pp. 191–199.
Craw, J. H., and Low, A., **PSAS**, vol. 67, 1933, pp. 308–311.
Edwards, A. J. H., **PSAS**, vol. 65, 1931, p. 421.
Edwards, A. J. H., and Low, A., **PSAS**, vol. 66, 1932, pp. 418–426; vol. 67, 1933, pp. 164–176.
Gordon, J. T., and Waterston, D., **PSAS**, vol. 67, 1933, pp. 354–361.
Low, A., **PSAS**, vol. 67, 1933, pp. 176–186.
Ritchie, J., and Dow, D. R., **PSAS**, vol. 69, 1935, pp. 401–415.

Scotland, and the same is true of the Corded. In fact, three out of four dolichocephalic male crania from short cists seem to be of a Megalithic type, while only one has the characteristic vault form of the Battle-Axe people. Long heads are less frequent here than in England, and the original eastern Mediterranean brachycephalic type is in the majority. Logically, one would expect that the Food Vessel people belonged to this racial variety.

It is impossible, however, to determine with any certainty the physical type of the Food Vessel people in Scotland, for only four complete skeletons have been associated with this pottery form. Three, however, which are males, are all brachycephalic and of medium stature, and belong, in the totality of their features, to a small Beaker variety,[69] as does the single female. Two other individuals, represented only by long bones, were, respectively, 166 and 173 cm. tall. Little is to be learned, unfortunately, from the members of this small group, except that they were no different from the Beaker people who occupied the same type of cist.

There is, however, one far better way to discover the physical affinities of the Food Vessel people, and that is by a study of the Bronze Age remains from Ireland. As far as we know from published evidence, the Beaker people never went to Ireland at all. The thirty odd known Irish skeletons of the Bronze Age, taken from short cists, were associated with food vessels in most cases, or at least when there is known to have been any pottery.

The series as a whole [70] (see Appendix I, col. 26) is tall and slender boned; the skulls, almost exclusively brachycephalic, are often thin walled; the bony relief is rarely as prominent as in the British specimens. Metrically, the Irish crania are narrower headed and narrower faced than the Scottish, and are almost identical with the Adlersburg group in Germany, and quite close to the series from Cyprus. Their most notable difference from the British group, which confirms their similarity to the skulls from Cyprus, is in their narrow facial breadth. In this and in many other ways, the Scottish skulls are intermediate between the English and the Irish.

[69] Dow, D. R., **PSAS,** vol. 69, 1935, pp. 401–415.
Low, A., **PSAS,** vol. 64, 1930, pp. 191–195; vol. 65, 1931, pp. 418–426. **PAAS,** 1904–06, pp. 133–142.
Waterston, D., **PSAS,** vol. 67, 1933, pp. 354–361.

[70] A composite group from the following sources:
Haddon, A. C., **PRIA,** vols. 3–4, 1896–98, pp. 570–585.
Martin, C. P., **JSAI,** vol. 62, 1932, p. 55; vol. 64, 1934, pp. 87–89.
Martin, C. P., Price, L., and Mitchell, G. F., **PRIA,** vol. 63, 1936, sec. C, #7.
Movius, H. L., **PRIA,** vol. 61, 1934, pp. 258–284; **JSAI,** vol. 59, 1929, pp. 99–115; vol. 64, 1934, pp. 73–85; vol. 65, 1935, pp. 213–222.
Shea, S., **JGAS,** vol. 12, 1925, pp. 13–22.
See also:
Martin, C. P., *Prehistoric Man in Ireland.*
Morant, G. M., **JRAI,** vol. 66, 1936, pp. 43–55.

The Irish Bronze Age people who were buried in association with food vessels were, therefore, members of the racial type which was originally linked with the Beaker complex, without the associated Borreby and Corded elements. Childe finds possible prototypes of the food vessels both in Germany and in Spain.[71] Without doubt, in any case, there were movements from northern Spain and the western end of the Pyrenees during the Bronze Age, which brought halberds to Ireland, and thence to Scotland, along with other cultural innovations. These movements were quite late, but so, in all probability, was the spread of the Food Vessel people, who often incinerated.

It is necessary to choose between two routes of invasion for the Food Vessel people, for they were obviously not indigenous. The first, from Germany and Holland, would be somehow separate from the Beaker invasions, but yet would bring the most basic Beaker physical element. The second is from Spain, where the Beaker people were probably only one of a number of related brachycephalic groups. The latter seems the more likely, purely on racial grounds; furthermore, on the Scottish food vessels there are often cord impressions, on the Irish there are none. The direction, therefore, was probably from Ireland to Scotland and not vice versa.

(9) THE BRONZE AGE IN CENTRAL EUROPE

In the Early Bronze Age there were, aside from the Aegean, three important cultural centers in Europe—southeastern Spain, Britain, and central Europe. We have already dealt with the first two and studied the racial derivations of their peoples. In central Europe, the center of civilization was again on the Danube; in Bohemia, Moravia, Silesia, Lower Austria, and Saxo-Thuringia. The Bronze Age culture of this Danubian region is called Aunjetitz (Únětice) after an important site in Bohemia.

The origins of this Aunjetitz culture were multiple. The elements of which it was composed include: the basic local Neolithic and Copper Age; northern influences which were mostly Corded; the Bell Beaker invasion; and metallurgy from Anatolia and the Aegean, coming directly overland.[72]

The evidence as to the racial composition of this culturally heterogeneous population is fortunately abundant and clear. A number of large and well-analyzed series makes it possible to determine its nature without much doubt. On the whole, the group is moderately varied. Three major elements are involved: the short, moderately dolichocephalic, high-vaulted, small-faced Danubian Neolithic type; the familiar Corded form, and some brachycephals, in moderate numbers, which are probably for

[71] Childe, *The Prehistory of Scotland*, pp. 89–95.
[72] Childe, *The Bronze Age*, pp. 139–140.

the most part of Bell Beaker origin, although the same racial type may have come up the Danube from the Black Sea and the Aegean. Dinaric influence is most evident in the earliest Aunjetitz sites of Lower Austria, as at Hainburg-Teichtal,[73] but it disappeared shortly through absorption.

One of the most fruitful groups for examination is that of the skeletons from the Lower Austrian cemetery of Gemeinlebarn.[74] Here fifty-one adult crania were found which were in condition for study, to which have been added twenty-five others from smaller sites in Lower Austria and Moravia, making a total of forty-seven male and fifty-two female skulls, as well as a large number of associated long bones.

The mean stature of the males is 165 cm., a moderate figure, lying between that of the earlier Neolithic Danubians and the Corded people, as represented in the larger series in which the latter appear, in Scandinavia and England. The limb proportions show a greater length of the distal segments in both arms and legs than is the case with most historic Germanic or Nordic skeletons—the Lower Austrian Aunjetitz people resembled their Neolithic ancestors in this respect. The bones, however, are quite heavy and powerful, and show that they must have had wide and heavy shoulders.

The crania (see Appendix I, col. 27) belong metrically about half-way between the Corded and Danubian Neolithic means in almost every character; the only exception being a slight addition in the head breadth dimension which might be attributed to the inclusion of a few brachycephals. The cranial index, which varies individually from 64 to 85, centers about a mean of 74; and dolichocephaly is the prevailing form. The profile of the skull as seen from above usually takes one of two forms—a long oval with almost parallel sides, which is the Corded type, and a pentagonoid, or "shield shape," which is the Neolithic Danubian. The vaults are high, in most cases higher than the breadth, a feature which is derived from both of the principal ancestral types. The face is quite long in both segments, and narrow. Although the mean nasal index is mesorrhine, a little less than half of the series is leptorrhine. The orbits, like those of both earlier strains, are of moderate height.

In the male series, only four crania have indices over 78, and all of these are curvoccipital. One of them, with heavy browridges, a wide interorbital distance, a wide, deep jaw with everted gonial angles, and no canine fossa, looks like some intruder from the northern European forests, such as we have already met in the Neolithic; while another, which is hyperbrachycephalic, has an extremely narrow face and jaw, and may be either an Anatolian or a Beaker remnant.

[73] Geyer, E., **MAGW**, vol. 60, 1930, pp. 65–140.
[74] Szombathy, J., **MAGW**, vol. 64, 1934, pp. 1–101.

The group as a whole has a normal to excessive development of the browridges, and a narrow-rooted form of the nasal bones, which spring prominently from a considerable nasion depression. The continuous fronto-nasal profile of Near Eastern Bronze Age skulls is apparently alien to this composite type.

The above discussion could be applied without much change to other Austrian Aunjetitz series, notably that from Stillfried,[75] which includes nine males. Here the ratio of factors involved may be slightly different, for the cranial index mean is mesocephalic, and the nasal index purely leptorrhine—however, the group contains no brachycephals.

Nearly a hundred crania from Bohemia, collected from a number of sites[76] (see Appendix I, col. 28), are on the whole extremely dolichocephalic, with a mean index of 71. A series of thirty-two males[77] (see Appendix I, col. 29), like the Austrian group, is again intermediate in most if not all measurements between the Corded and Danubian Neolithic means. As with the Gemeinlebarn series, the longest crania are the highest, and possess the longest faces. A Corded-Danubian cross, with a very little Dinaric (since the highest indices go up to 83) is indicated. This hybrid form, as will be seen later, may be given the name "Nordic" in the skeletal sense, since it seems identical with that of historic Nordic peoples living in the same area.

The stature of Bohemian and Moravian Aunjetitz males, as with those from Lower Austria, is about 167 cm.[78] This is considerably less than the Corded stature for Scandinavia, and that of the British Bell Beaker long heads, but more than that recorded in the central European Corded series of Neolithic date. Either our groups are too small for accuracy, which is quite probable, or else the Corded people of central Europe were not as tall as those who invaded the far northwest. At any rate, the Aunjetitz people of central Europe are less exaggerated in head and face dimensions than those whom we have previously studied, and anticipate the "Nordic" peoples of the Iron Age.

Around the peripheries of the Upper Danubian center, modifications of the standard Aunjetitz racial amalgam occurred. In Saxony and Thuringia, where there was an especially strong Corded cultural element, the coincident type was of course equally strong.[79] But on the Rhine, the Bell Beaker cultural influence continued, and brachycephals also persisted.[80] In the Tyrol and Upper Austria, Dinarics of the Bell Beaker type re-

[75] Schurer von Waldheim, Hella, **MAGW**, vol. 39, 1919, pp. 247–263.
[76] Stocký, A., **AnthPr**, vol. 9, 1931, pp. 225–275.
[77] Hellich, B., *Praehistorické lebky v Čechách ze Sbírky Musea Království Českeho.*
[78] Matiegka, J., **MAGW**, vol. 41, 1911, pp. 348–387.
[79] Heberer, G., **VGPA**, vol. 8, 1937, pp. 59–68.
[80] As at Rheinsheim. Basler, A., **MAGW**, vol. 55, 1925, pp. 261–266.

mained firmly ensconced,[81] where their survival in this mountain refuge was destined to be permanent.

About forty skulls are known from the Bronze Age sites of Switzerland.[82] The most important fact to be deduced from them is that the old Neolithic elements persisted with little change. An infiltration of Aunjetitz culture was accompanied by the addition of some Corded types to the group, and in the meanwhile a few planoccipital brachycephals of Bell Beaker type appeared. On the whole, the Swiss seem to have become slightly longer headed during this period, probably due in large part to Aunjetitz influence.

It is impossible to carry this survey of the Early and Middle Bronze Age racial types in central Europe much farther to the westward. We have already seen that brachycephals of the type which spread through the Mediterranean during the Bronze Age entered the southern departments of France, near the eastern end of the Pyrenees and the Gulf of Lyons (page 149). Aside from this Spanish overflow in the south, the French Bronze Age was largely confined to two other peripheral points—Savoie and Franche Comté—and Brittany in the extreme west.

On the northeastern flank of France, in Franche Comté, a number of skeletons have been taken from tumuli which apparently date from the Middle Bronze Age, a time at which invasions spread over the upper Rhine and Jura from the Bavarian highlands into northeastern Gaul.[83]

Seven out of eight skeletons of this period were those of tall, planoccipital, brachycephals,[84] who belonged, as far as one can tell, to a Bell Beaker type familiar in earlier times in the Rhinelands. Two tumuli of later date contained high-vaulted dolichocephalic crania, belonging to small-statured individuals, like the single dolichocephalic example from the earlier group. Thus, as far as we can tell, a Bell Beaker type, associated with an older Danubian Neolithic element, entered northeastern France in the Middle Bronze Age from the highland belt of southern Germany, south of the central Aunjetitz range.

In Brittany, the earliest metal industry was mostly of the Middle Bronze Age; round barrows were built apart from the megalithic tombs, which were still used by the descendants of the bringers of that cult to the Atlantic seaboard. In one cemetery, that of Saint-Urnel en Plomeur in Finistère,

[81] Meyer, A. B., **MAGW,** vol. 15, 1885, pp. 99–106.

[82] Pittard, E., **Anth,** vol. 10, 1899, pp. 281–289; vol. 17, 1906, pp. 547–557; **ASAG,** vol. 7, #1, 1934, pp. 1–7; **RA,** vol. 45, 1935, pp. 5–12.
Schenk, A., **BMSA,** ser. 5, vol. 8, 1907, pp. 218–228; **REAP,** vol. 15, 1905, pp. 389–407.
Schlaginhaufen, O., **BSGA,** vol. 2, 1926, pp. 15–24; **MAGZ,** vol. 29, 1924, pp. 220–241.

[83] Childe, *The Bronze Age,* p. 174.

[84] Piroutet, M., **Anth,** vol. 38, 1928, pp. 51–60.

tall, dolichocephalic people with large heads, narrow noses, and robust jaws were buried throughout the Bronze Age.[85] There were Beaker people in Brittany as well, and one may suppose the presence, in addition, of the usual Beaker physical type.

Aside from these instances there are no Bronze Age remains from France which give us a definite picture of the population of any specific part of the country. France, for the most part, failed to participate in the great cultural movements of the Bronze Age, and was a backwater in which Neolithic and even Mesolithic peoples survived with little change in their manner of living.

(10) THE BRONZE AGE IN THE NORTH

During the Early Bronze Age, Scandinavia and the eastern Baltic countries had been unable to obtain enough metal for tools and weapons, and hence had enjoyed the Late Neolithic efflorescence which we have already studied. Their first real metal period, therefore, was the Middle Bronze Age, later than the first Beaker settlement in England, or the Aunjetitz development in central Europe.

The Scandinavian Bronze Age probably began about 1500 B.C., and lasted for nearly a thousand years. It was a period of great prosperity, for Jutish amber brought bronze and gold objects to the north in trade. The limits of this cultural center, however, were restricted. Most bronze has been found in Denmark, since in Sweden and southern Norway metal was dear, and seldom discarded in graves. North of the sixty-eighth parallel of north latitude, the Arctic stone age prevailed throughout this period on the coasts of the Arctic Ocean and in the forests and mountains [86] of Norway and northern Sweden, as well as in Finland.

During the Middle Bronze Age, cremation, which had begun elsewhere as early as Danubian Neolithic times, gradually crept in as a major substitute for the earlier inhumation, and by the beginning of the Late Bronze Age, it had become the only method of disposing of the dead. For this reason skeletal material from the five hundred year stretch of the Middle Bronze Age becomes progressively scarce.

In Sweden we are limited to some twenty-one skulls, of which thirteen are those of males.[87] They belong to types already familiar to us from the Neolithic, and show no change of population. If anything, however, the long-headed elements are even more in evidence, and the head form is prevailingly dolichocephalic. In Denmark again, twenty seems to be the

[85] Le Pontois, Bernard, *Le Finistère préhistorique.*
[86] Shetelig, Falk, and Gordon, pp. 170–172.
[87] Arbo, C., **FVO**, 1901.
Hillebrand, B. E., **ATS**, 1864.
Retzius, G., *Crania Suecica;* **Ymer**, 1900.

limit; [88] and here the old Neolithic population survived without perceptible alteration. The Bronze Age men were as tall as their predecessors, with a mean stature of 172 cm.; and the blend of long- and round-headed types struck the same high mesocephalic mean.

There is evidence that some of the Danes of this period were blond, since the hair, teeth, and clothing of a young woman, buried at Egtved, Jutland, were perfectly preserved by the tannic acid from the oak coffin in which she lay, under a mound. This hair, cut short on the forehead and hanging in a long bob at the rear, was apparently straight as well as fair. Unfortunately, the bones were not also preserved, and it is impossible to tell to which of the prevalent Neolithic and Bronze Age Danish racial types she belonged.[89]

On the whole we may be reasonably confident that the Middle Bronze Age in Scandinavia involved no important racial change. The same blend of at least three peoples, who had combined to create a brilliant Late Neolithic, were carried over into the age of metal.

In the far north of the Scandinavian Peninsula, out of reach of all but the most remote Bronze Age influences, we are led, on archaeological grounds, to believe that the older peoples continued to lead their simple existence. Although there is as yet no direct skeletal evidence of their survival, a body of collateral evidence from across the Baltic makes this, by parallel inference, certain.

At various points near the Esthonian coast of the Gulf of Finland, a remarkable group of skeletons has been found in cists under tumuli, probably dating from about 1200 B.C., near the beginning of the Middle Bronze Age, although they may possibly have been as much as seven hundred years later.[90] (See Appendix I, col. 30.) Ten male and five female skulls belong to one homogeneous racial type, extremely dolichocephalic, with a mean cranial length of 195 mm. The faces are very long, and also wide; the nose is of great height. The browridges are in many cases heavy, and the nasal bones high and projecting, but deep-set under a strong glabella. These skulls are similar in many respects to the Corded racial type, especially as exemplified by the dolichocephalic element in the British Bronze Age population. Like the latter, they are associated with long bones which indicate tall stature. The males, in fact, averaged 172 cm.; the females 165.

Unlike the Corded group, however, these Esthonian skulls are as large in vault and face size as the Upper Palaeolithic group from central Europe,

[88] Nielsen, H. A., **ANOH**, II, vol. 21, 1906; III, vol. 5, 1915, pp. 360–365.
Virchow, R., **AFA**, vol. 4, 1870, p. 55.
[89] Coutil, L., **BSPF**, vol. 27, 1930, pp. 187–189.
[90] Friedenthal, A., **ZFE**, vol. 63, 1931, pp. 1–39.

and equal the latter in a number of telltale dimensions, including cranial length, orbital width, and bizygomatic diameter. In the height dimensions of the vault and face, the Esthonian crania exceed all known European groups of any age.

This is a clear case of the blending of Upper Palaeolithic survivors, who had preserved a hunting life in their northern forest, with Corded horsemen and cultivators who had penetrated their fastness, bringing them their first direct contact with food-producing civilization. If the Upper Palaeolithic group survived in Esthonia, it could have done so in Norway as well. It is worth noting the exaggeration of the Corded facial and cranial heights in the Esthonian mixture, along with the Upper Palaeolithic retention of gross vault size and of face breadth. This will later be encountered in several living North European populations.

(11) THE BRONZE AGE ON THE EASTERN PLAINS

The remaining portions of Europe, for which there is skeletal documentation of Bronze Age date, may be studied as a single unit. This consists of the grassy plain which extends from northern Germany and the Baltic states, south of the forests, across Poland and southern Russia into Siberia. It must be remembered that during the Bronze Age this plain was drier than at present, and that the agriculture of the Neolithic farmers had been discouraged to a large extent both by drought and by the incursion of Battle-Axe people who had first appeared in the Late Neolithic in central and western Europe.

The evidence from Poland, although meager [91] shows that the Corded concentration which had taken place some centuries earlier on Polish soil had yielded to the smaller dolichocephalic blend already observed in Austria and Bohemia. During the earlier Bronze Age, there had been a number of Bell Beaker settlers in Poland as well, who may also have left descendants.[92]

The Bronze Age Ukrainians, again, belonged to the same "Nordic" type, with a mean cranial index of 74,[93] without the excessive vault height of the Austrian and Bohemian groups. In Russia the height is less than the breadth in most instances.

In the parts of southern Russia immediately north of the Black Sea, from the Kiev government eastward, Bronze Age remains have not been studied in a manner sufficient to permit the formation of adequate conclu-

[91] Nine Bronze Age crania have been published by:
Czortkower, S., **AnthPr,** 1932, pp. 212–218.
Stojanowski, K., **PAr,** vol. 3, 1925–27, pp. 52–53.
Tur, Jan, **Swiatowit,** vol. 3, 1901, pp. 85–93.
[92] Sedlaczek-Komorowski, L., **BAPS,** ser. B, vol. 2, 1932, pp. 253–257.
[93] Debetz, G., **AntrM,** vol. 4, 1930, pp. 43–105.

sions. What information is available shows that the population was presumably long headed and of tall stature.[94] The same is true of the population of the northern slopes of the Caucasus, where the crania are for the most part characterized by exceptionally long faces, narrow noses, and vaults of considerable height, like the Corded crania farther west,[95] although some Megalithic forms may also have been present. Some of the Caucasian crania, however, are those of small dolichocephals, and a few, for the most part females, are brachycephalic. In the latter part of the Bronze Age, the people on the northern slopes of the Caucasus practiced cranial deformation of the Hittite variety, which reached, in its southward diffusion, to Egypt.

To the east of European Russia, in western Turkestan and southern Siberia, there was a nucleus of Bronze Age civilization, which had cultural connections with the Danube, the Caucasus, Iran, and China.[96] That the participants in this Bronze Age were men of European racial type is very apparent from the remarkable series of one hundred and fifteen adult crania from kurgans in the Minussinsk district of southern Siberia [97] (see Appendix I, col. 31), near the headwaters of the Yenisei.

This country, which is now the home of nomadic tribes of Kirghiz and Kalmucks, was, as early as the second millennium before Christ, occupied by a population of purely European character. The series, coming mostly from the first millennium B.C., while reasonably homogeneous, shows as much variability as do most modern groups. The range of the cranial index includes all head forms, among which are a few planoccipital brachycephals, but the mean is dolichocephalic; similarly the faces are prevailingly long, the noses narrow. In general, although individual crania are as large and as long as the most extreme Corded form, the vaults are of moderate size, and the height is considerably less than the breadth.

In lowness of vault and breadth of face, the Minussinsk skulls resemble the Ukrainian Bronze Age group. On the whole, they form a far eastward wing of the typical Bronze Age population which reached from Austria and Bohemia to central Asia—and the term "Nordic," in the skeletal sense, is as applicable in the east as in the west. One must expect regional differences in a racial type covering such an extensive area. In this case

[94] Gochkevitch, quoted by Tallgren, A. M., **ESA,** vol. 2, 1926.
Rau, P., **ESA,** vol. 4, 1929, pp. 41–57.
[95] Broca, P., **BSAP,** ser. 2, vol. 8, 1873, pp. 572–578.
Chantre, E., **RDAP,** ser. 2, vol. 4, 1881, pp. 247–254.
Smirnov, M., **BSAP,** vol. 12, 1877, pp. 541–553.
Virchow, R., **ZFE,** vol. 22, 1890, pp. 412 ff.
[96] Tallgren, A. M., **ESA,** vol. 2, 1926.
[97] Goroshchenko, K., *Kurgannie cherepa Minusinskago Okruga,* **OMM,** #2, 1900.
Debetz, G. F., **AZM,** #2, 1932, pp. 26–48.

the difference is simply that the vaults are higher and the faces narrower in the west, as far as Poland, and the reverse from the Ukraine on eastward.

The Andronovo or Minussinsk Kurgan culture lasted from about 1000 B.C. to 1 A.D., and was followed by other cultures, which lasted until the eighth century, when the Kirghiz came in.[98]

These later peoples introduced iron, and the habit of making plaster death masks. Not only do these masks represent in many cases a long-headed, narrow-nosed and often aquiline, and narrow-faced people, but the plaster contains in some instances blond hairs pulled out of the beard. The head hair, often preserved on the corpses, is usually brown.

During the fourth century A.D., the physical type definitely changed, as one can tell from the masks—the face is now wide and flat, the nose broad and flat, with a very low bridge. Eye slits are painted blue—and the hair blue with black lines.[99] Thus not until after the time of the Huns were the Nordics of southwestern Siberia replaced by mongoloids.

(12) THE FINAL BRONZE AGE AND CREMATION

The two or three centuries immediately preceding the 1000 B.C. mark in central Europe, and a little later in more backward parts, witnessed several cultural innovations which mark the beginning of the Late or Final Bronze Age. To the physical anthropologist, the most important of these was cremation, on account of which our knowledge of race during this most important period is nearly at the zero point. This hiatus is especially unfortunate, since the findings of the archaeologists make it clear that the Late Bronze Age was a time of considerable shifting and expansion of peoples.

In most of Europe, the Sub-Boreal climate gave way to the Sub-Atlantic, which brought an increase in cold and dampness, and fostered the growth of forest on former grasslands. The area of soil suitable for cultivation grew smaller, while the number of people had increased; these factors alone were enough to cause displacements of population. Across the plains of Asia as well as of Europe, large movements took place; the migrations of the Aryan ancestors into northern India through Afghanistan, and into the Iranian plateau, were Late Bronze Age phenomena.

Cremation had begun in Europe, as an alternate funeral rite, early in the Bronze Age, and had gradually increased in popularity in the plains north of the Alpine mountain barrier. Its chief center of expansion seems to have been the central and eastern grasslands, from eastern Germany over to Russia, where it was particularly useful for nomadic peoples faced with the problem of disposing of their dead on frozen ground.

[98] Golomshtok, E., **AA**, vol. 35, 1933, pp. 319–322.
[99] Golomshtok, E., **BUMP**, vol. 2, #4, 1933, pp. 40–45.

The vehicles which diffused this trait over most of Europe during the Late Bronze Age are called Urnfields cultures, which arose on the plain north of the Carpathians, from Silesia to the Ukraine. From this center they spread in all directions. Some went southward over the Alps to Italy, while cremation was introduced into Greece before the time of the Trojan war. From a secondary center of expansion in the Alpine highlands, a special Urnfields diffusion entered the British Isles as a major invasion.

For obvious reasons, the skeletal remains associated with the Urnfields cemeteries may be disposed of very briefly. Cremated bones which have survived the rite are usually so fragile that little in the way of racial identification has been attempted, although it has been shown by experiment that they shrink little or none in the fire.[100] Those from the British Isles indicate in general that the invaders of this time may have been smaller and slighter than their predecessors. A small series of crania from southern England which escaped cremation were those of Alpines of the brachycephalic Lake Dwelling type,[101] brought from the secondary Urnfields center in Switzerland. On the other hand, eight Late Bronze Age skulls from northwestern France [102] are all meso- or dolichocephalic; and may have come directly from Germany with the vanguard of the Keltic migrations. Eight other skulls, from the Ukrainian urnfields,[103] are long headed, and similar to the immediately preceding "Nordic" type of the same region.

Some of the south Russian and Caucasian remains already studied are of Late Bronze Age date, as are those from Siberia, both having escaped cremation. The general time scale of cultural phenomena in central Asia as compared with Europe would indicate that important ethnic movements were not passing from east to west at that time. By the end of the Middle Bronze Age, the ethnic elements which were to form the population of Europe at the beginning of the Iron Age had all arrived; during the period of cremation, no new ingredients were added, but those already there participated in a considerable readjustment and recombination.

(13) SUMMARY AND CONCLUSIONS

The Bronze Age covered, in most of Europe, the brief span of some six centuries, as compared with an expanse three times as long in Egypt and Mesopotamia. During these six centuries, however, important racial changes took place in many parts of the European world, while in the two valleys from which European civilization emanated, the personnel

[100] Movius, H. L., Jr., **PRIA**, vol. 61, 1934, pp. 282–283.
[101] Keith, Sir A., **JA**, vol. 11, 1931, pp. 410–418.
[102] Bouchet, Dr., **Anth**, vol. 16, 1905, pp. 309–316.
Piroutet, M., **Anth**, vol. 38, 1928, pp. 51–60.
[103] Debetz, G., **AntrK**, vol. 4, 1930, pp. 93–105.

remained constant. The parts of Europe most affected by Bronze Age movements of people were the north and west; and hence these activities may be interpreted as a late phase of the displacements initiated by the retreat of the last glacier, and continued by the discovery of the principles of food production. By the end of the Bronze Age, the centers of civilization had begun their movement northward and westward, toward Greece and Italy, movements which were later to push much farther in the same direction. It is perhaps no coincidence that, since the beginning of the Neolithic, people from the east and south had migrated to the north and west ahead of this progression.

Among the problems left over from the Neolithic which the evidence of the Bronze Age has helped to clarify is that of the immediate origin of the Danubians. In the Neolithic Danubian-like peoples cultivated the rich soil of southern Russia and of western Turkestan. We now know that they must have formed a large bloc of agriculturalists occupying Asia Minor as well, and probably also the Caucasus. Thus they may have come into the Danube Valley from either southern Russia or Anatolia, or both; and their earlier derivation from the agricultural highlands is established.

A second problem, which arose only during the Bronze Age, is the origin of the new racial type which appeared, shortly before 2000 B.C., apparently from nowhere, in Asia Minor, Palestine, and Cyprus. This new type was tall, round headed and frequently planoccipital; its nose was prominent and narrow; its face triangular and of moderate length. In its associated morphological features, it forecast the appearance of the Dinaric race.

Brachycephals of this type followed the old Megalithic sea route to Italy, the Italian islands, and Spain. In Spain some of them seem to have associated themselves with cultural phenomena known as the Bell Beaker complex. As the Bell Beaker people, these newcomers travelled from Spain to the Rhinelands and to central Europe, where they were the first disseminators of metal. Having appeared in the Rhineland in considerable numbers, they mixed with the older Borreby sub-stratum which had remained there since the Mesolithic, and with Corded people coming from the east. This triple combination moved bodily down the Rhine and across the North Sea to Britain. Thus, during the Early Bronze Age, England and Scotland were invaded by people of entirely new types, who came in numbers sufficient to change the population of these countries in a radical manner. At the same time, other movements of these brachycephals from the eastern Mediterranean passed by sea from Spain to Ireland and from Ireland across to Scotland.

The appearance of these early Dinarics on the Asiatic and European scene marks the advent of the third important brachycephalic racial type

which we have encountered in our survey of the post-glacial prehistory of the white race. Unlike the Borreby and Alpine types, it cannot be easily or plausibly explained as a simple Palaeolithic survivor. Facially it is basically Mediterranean; it seems to be a Mediterranean type brachycephalized by some non-Mediterranean agency.[104]

These Dinarics did not come from central Asia, nor from Mesopotamia or Egypt. Facially, they resemble the dolichocephalic residents of Asia Minor and the eastern Mediterranean coast lands of the period during which they first appeared, in that both have in common a high-bridged, high-rooted nose, high orbits, and a sloping forehead. Until further evidence is found, it is safer to hold that the culture-bearing Dinarics of the Bronze Age developed in the Syrian highlands, where a similar type of brachycephaly is now present, than to try to bring them from a distance.

Another Bronze Age event of racial moment was the gradual disappearance through amalgamation of the Corded people and of the Danubians, and the emergence of an intermediate long-headed form. This latter, which inhabited the immense stretch of territory from Germany and Austria to the Altai Mountains, occupied an intermediate position in the total roster of greater Mediterranean racial variations.

In Austria and Bohemia the high vault and narrow face of both Corded and Danubian strains persisted, but from southern Russia over to the Altai, the vaults were lower and the faces broader. Two variants thus appeared, a western and an eastern. There is evidence that the eastern group, at least, was partly if not prevailingly blond. Both eastern and western divisions may with some confidence be compared to the "Nordic" peoples who appeared historically during the Iron Age.

At the end of the Bronze Age, for a period of two or three centuries, the pall of cremation falls over the racial history of Europe. When the smoke has lifted during the Early Iron Age, we shall see what changes have taken place during this period of darkness.

[104] The principle of Dinaricization will be explained in Chapter VIII, section 6, and Chapter XII, sections 11, 12, and 17. See also legend, Plate 35.

Chapter VI

THE IRON AGE

(1) RACE, LANGUAGES, AND EUROPEAN PEOPLES

In the preceding chapters, we have found it necessary to use archaeology as a system of landmarks by which to chart the movements of human groups and their relationships with one another; this study of race in terms of culture was essential. Ideas are originated, diffused, and conserved by people, and people interbreed. A complete and sudden replacement of one culture by another implies a drastic change of personnel, while a gradual merging of a new culture with an old one must equally imply the survival, at least in part, of the older population. By following these rules we have seen that racial and cultural movements are truly connected, and in no instance in which the skeletal record is adequate could any contradiction be seen.

The subject of this book, however, is race, not culture; although culture in the archaeological sense has been a valuable guide. But once we arrive at the period of history it is no longer necessary to deal exclusively with pots and axes and methods of burial; we may consider people as linguistic and political groups, with known names and ethnic relationships. This has already been possible with the civilized nations of preclassical antiquity, such as the Egyptians, the Sumerians, the Babylonians, and to a certain extent with the Cretans and Hittites, whose writings have so far furnished little or nothing in the way of documentary information, as well as with the early ancestors of the Greeks.

The peoples of central and northern Europe did not learn to write until relatively recent times—in most instances well after the beginning of the Christian era, and in some cases only within the current millennium. But their identities are in many instances known to us from the writings of the classical geographers and historians, and, in the Dark Ages, from Arabic sources as well. Farther east, in central Asia, the diligence of Chinese historians has been of great assistance. In our study of the early part of the Iron Age, archaeology will still be needed; but by the time of the Christian era it will be possible, for our purposes, to dispense with it almost completely, for in treating fully historical and living cultures, language serves as the best-known, most easily designated, and most convenient framework available for the creation of units suitable for racial study.

Heretofore, we have said little about language. The speech of the peoples with whom we have dealt has been unknown to us in almost all instances. The exceptions are few: The Egyptians, as we well know, spoke a language of the Hamitic stock, with considerable Semitic influence. The Babylonians and Assyrians spoke Semitic, while the Sumerian language, although it can be read, has not yet been related with certainty to any other known tongue or linguistic family.[1] During the third millennium, therefore, Hamitic and Semitic languages were used by civilized peoples, as was the still unclassified Sumerian.

Besides these known linguistic groupings found in antiquity, there was another group or rather collection of languages spoken in the eastern Mediterranean and Asia Minor. These included Lydian, and its probable derivative Etruscan; languages of the Caucasus, some of which still survive; a few languages of the Himalayas, such as Burushaski;[2] and a whole group in Greece and the Aegean Islands, if not farther west, known to us almost entirely by place names. Cretan may possibly have also belonged to this class of languages.

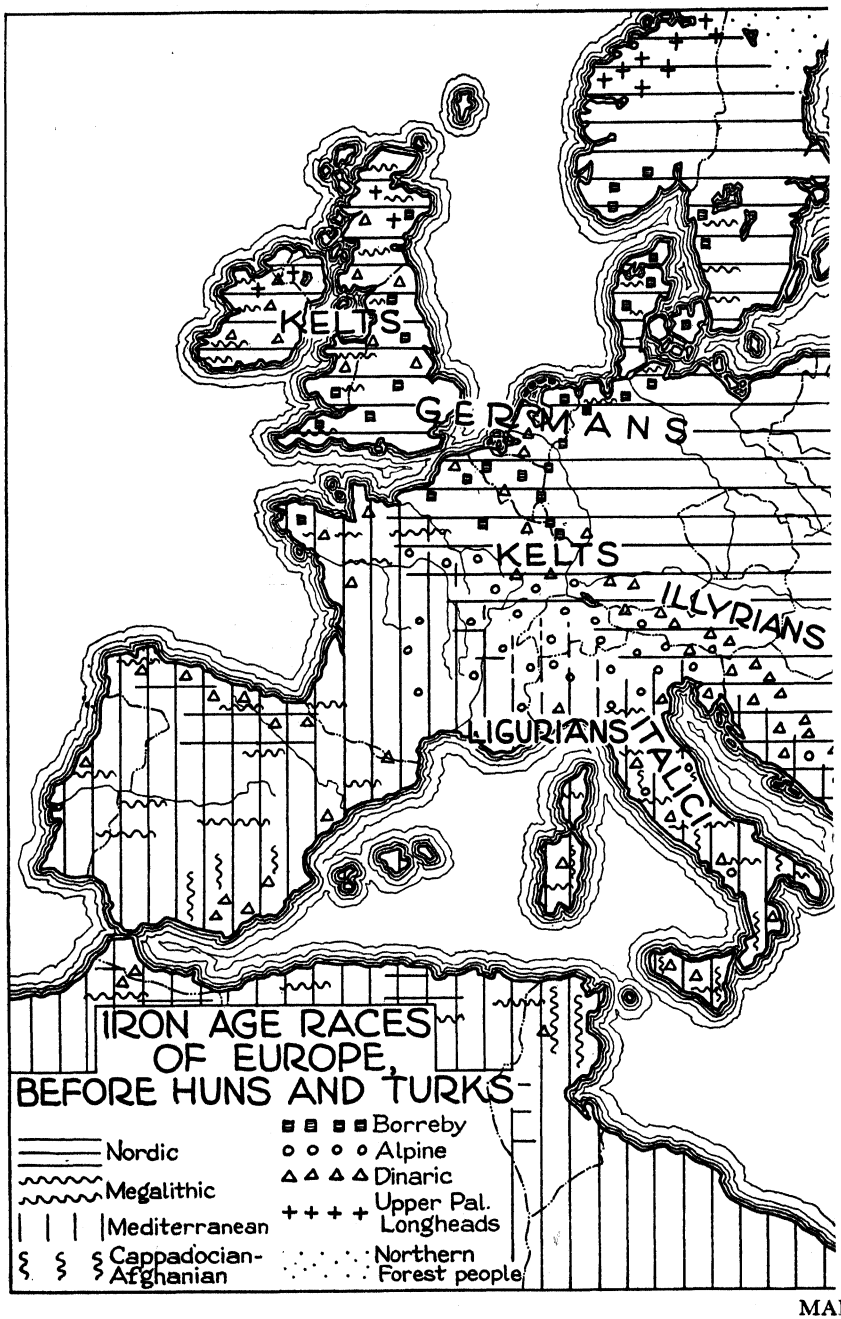
A school of linguistic experts headed by the late Professor Marr, and championed in the English-speaking world by Dr. Ephraim Speiser,[3] would group all of these languages together, including a whole row of extinct tongues stretching around the so-called "Fertile Crescent" from Syria to Elam. The name given this group is "Japhetic," coined to complete, with Hamitic and Semitic, a Biblical trinity. The living examples of this alleged class or family of languages, notably Georgian and Circassian, employ a number of sounds unfamiliar to the Indo-European, Semitic, and Hamitic families, and reminiscent of American Indian languages.

No one denies the wide distribution and importance of these languages in ancient times, but there is serious doubt that they may be united into a single stock comparable to Semitic, Hamitic, Indo-European, etc. It is more likely that this grouping includes a number of independent families, but at present it is too early to say what these may be; especially since most of them are extinct and will never, in all likelihood, be resuscitated. At any rate, it is probable that some of the seafarers of the Late Neolithic and of the Bronze Age who migrated westward along the Mediterranean

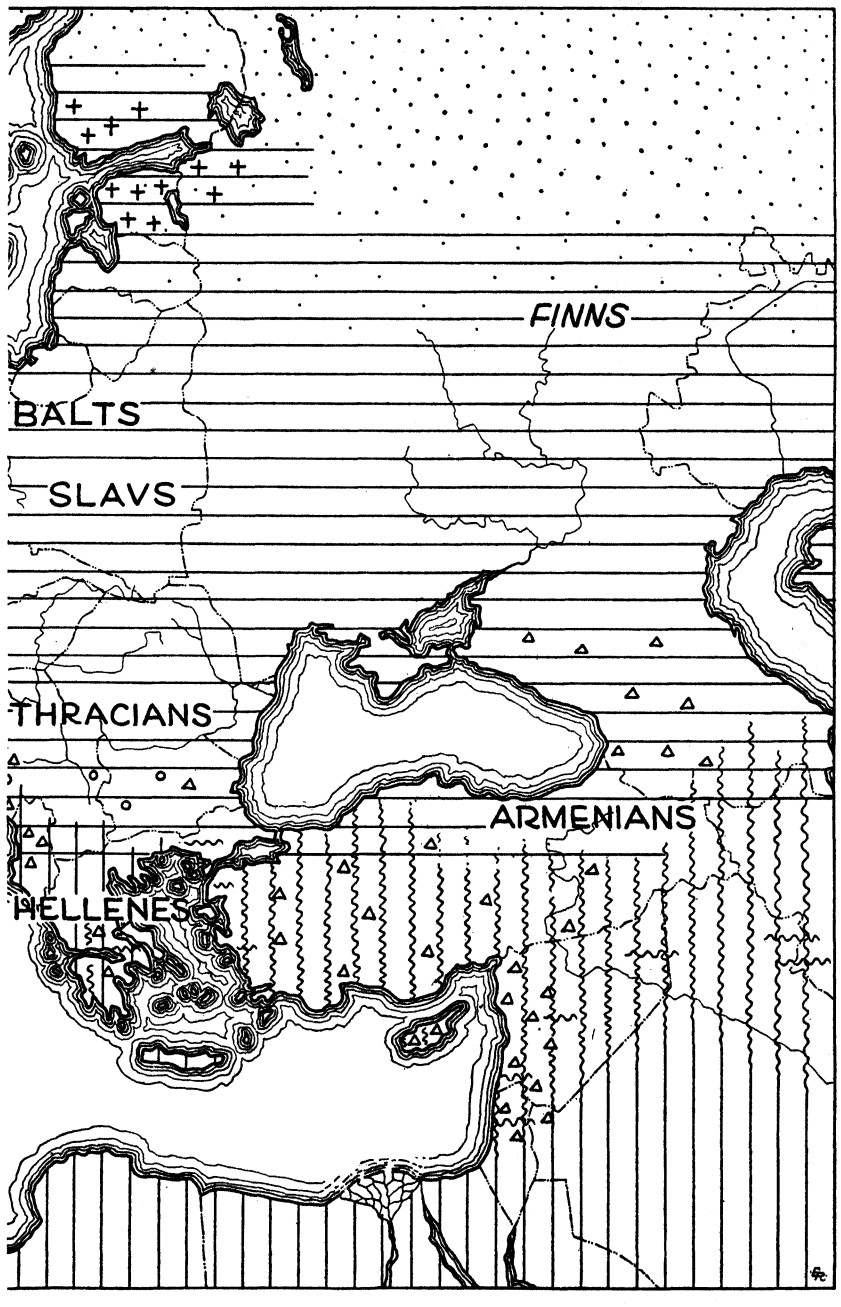
[1] The supposed kinship between Sumerian and Finno-Ugrian cannot easily be evaluated, owing largely to the gap of over three millennia between the known forms of each. Both groups are agglutinative, but the grammatical structure of Sumerian also has verbal prefixes, often with personal tone, unknown in modern Finnic or Ugric. Sumerian, like modern Finnic, Ugric, and Turkish, seems to have vowel harmony. In vocabulary there are few similarities. On the whole, this relationship cannot at the moment be proved or disproved.—Personal communication from Dr. J. Dyneley Prince. See also the Prolegomena of his *Materials for a Sumerian Lexicon.*

[2] Lorimer, D. L., *The Burushaski Language.*

[3] Speiser, E., *Mesopotamian Origins.*


KELTS
GERMANS
KELTS
ILLYRIANS
LIGURIANS
ITALICI
IRON AGE RACES
OF EUROPE,
BEFORE HUNS AND TURKS
Nordic
Megalithic
Mediterranean
Cappadocian-
Afghanian
Borreby
Alpine
Dinaric
Upper Pal.
Longheads
Northern
Forest people

MAP 4


FINNS
BALTS
SLAVS
THRACIANS
ARMENIANS
HELLENES

to Italy, the Italian islands, and Spain, and thence to Britain, France, and Scandinavia, spoke languages derived from the eastern Mediterranean. It is furthermore possible that modern Basque may be the only survivor of this linguistic migration; but this suggested relationship, referred to in the preceding chapter, must by no means be accepted as a certainty.

We do not know the languages of the Early Neolithic swineherds who introduced a food-producing economy to Spain and western Europe, including the lake shores of Switzerland, and we are not likely to find out. We do not, furthermore, know what medium the Danubians who performed the same pioneering function in another quarter used. The speech of the Corded people is equally unknown, and the old idioms of the Palaeolithic survivors in the far north, of the midden dwellers of Denmark, and of the Azilian survivors in Switzerland, are far past reconstruction. In Europe we must start as late as the Iron Age in our attempt to allocate languages to cultural or racial groups.

Today the members of the white race speak languages of the following linguistic stocks: Semitic, Hamitic, Indo-European, Ural-Altaic,[4] Euskarian (Basque), and various languages of the Caucasus and Himalayas, which it would be futile to attempt to classify here. At present the two most important are Indo-European and Ural-Altaic. Yet in antiquity, while civilization of the first water was in the hands of Hamites, Semites, and Sumerians, all Indo-European and probably most Ural-Altaic speakers, if they existed as such, were illiterate barbarians.

Indo-European languages are spoken by more white people today than are all of the others put together, several times over. People speaking Indo-European languages have monopolized the cultural advances of modern science; but it must not be forgotten that, as late as the Middle Ages, Semites, Turks, and Chinese were more advanced than the majority of Indo-European speakers. The linguists tell us that the Indo-European speakers did not initially domesticate one useful animal, or one cultivated plant.

Linguistically, Indo-European is probably a relatively recent phenomenon, which arose after animals had been tamed and plants cultivated. The latest researches find it to be a derivative of an initially mixed language, whose principal elements were Uralic, called element A, and some undesignated element B which was probably one of the eastern Mediterranean or Caucasic languages.[5] The plants and animals on which the

[4] Concerning the question of Ural-Altaic unity, see Chapter VII, p. 223.

[5] Uhlenbeck (**AA** '37) refuses to identify element B, or to call it specifically Caucasic. Nehring, however (Nehring, A., **WBKL**, vol. 4, 1936, pp. 7–229), feels certain that B is one of the group of which Caucasic may form a part.

economy of the early Indo-European speakers was based were referred to in words derived mainly from element B. Copper and gold were known, and the words for these commodities come from Mesopotamia.

Somewhere in the plains of southern Russia or central Asia, the blending of languages took place which resulted in Indo-European speech. This product in turn spread and split, and was further differentiated by mixture with the languages of peoples upon whom it, in one form or other, was imposed. Some of the present Indo-European languages, in addition to these later accretions from non-Indo-European tongues, contain more of the A element than others, which contain more of the B. The unity of the original "Indo-Europeans," could not have been of long duration, if it was ever complete.

They split, perhaps very early, into two groups, designated by the treatment of the palatal explosives of the *K* group. Among one branch, the so-called Satem, this was changed to spirants (*S*); the other, called Centum, preserved the original form of this sound, which also prevailed in the A or Finno-Ugric element. Centum speech became divided into a number of branches, of which surviving members are Keltic, Germanic, Italic, and Hellenic; Satem includes Slavic and Baltic, Armenian, Indic and Iranian, and probably Thracian,[6] in the sense of a contributing factor in modern Albanian. Others, such as Ligurian, Illyrian,[7] and Tokharian B (all Centum), have long been extinct.

On the whole, the Indo-European languages have been spoken by people who combined agriculture with animal husbandry, who were organized into a patrilineal society with at least the germs of a differential class system, and who worshipped an Olympian pantheon of Gods. The initial formation of the Indo-European linguistic stock by blending does not antedate the age of metal; the common culture of the earliest Indo-European speakers, insofar as it existed as a unit, had much in common with those of both the peoples of the Aegean and Asia Minor on the one hand, and of central Asia on the other. The mythology of the Altaian Turks, for example, is so nearly identical with that of the early Scandinavians that some close association in the not far distant past is necessary.[8] Furthermore, the ritual of the horse sacrifice [9] is so integral a part of the religion of both Indo-European and Altaic-speaking peoples that recent diffusion alone cannot explain the identity.

Indo-European languages as we know them must have come from easternmost Europe or western central Asia at no very remote time. Their

[6] Lowman, G. S., **Language,** vol. 8, 1932, p. 271.

[7] This may also be a factor in modern Albanian.

[8] Chadwick, Nora K., **JRAI,** vol. 66, 1936, pp. 75–112.

[9] Koppers, W., **Anthropos,** vol. 24, 1929, pp. 1073–1089; **WBKL,** vol. 4, 1936, pp. 279–411.

spread over most of Europe, and subsequently over the western hemisphere, Australia, and large segments of Asia in which they were originally not at home, is part of a general movement of expansion in which both race and culture have played their rôles. Yet we cannot with complete assurance associate any one culture earlier than the Iron Age with any specific form of Indo-European speech. Although Homer's heroes fought with bronze weapons, we are not sure exactly when and by what agency the pre-Dorian Greek dialects arrived in the racially and culturally composite Hellenic world; nor do we know exactly who brought Našili speech to Asia Minor.

One whole school of European archaeologists and linguists associates the Corded people with the diffusion of Indo-European speech.[10] Nehring, in a recent work of great detail and authority, would make the Danubians the original Indo-Europeans.[11] He would explain the Altaic cultural similarities by dividing the Indo-European culture and vocabulary into two elements: (1) an early horizon in which the ox was the most important domestic animal economically, and agriculture of primary importance; (2) a later horizon of indirect Altaic inspiration, in which the horse was supreme and agriculture secondary.

At the moment the evidence is growing that certain forms of Indo-European speech were very ancient in more than one part of the Mediterranean basin. Whatmough has definitely identified Ligurian as Indo-European,[12] and Ligurian was very old in Italy and in the Rhône Valley. Sapir sees in Philistine a form of Indo-European; [13] and would make the ark of the covenant a spirit-placing on wheels like the portable wicker shrines of the later Mongols. But neither of these identifications need carry us back earlier in history than the time of the troubles in Mesopotamia at the end of the third millennium, when northerners caused restless nights to the Babylonian kings, and the Hyksos invaded Egypt. It was after these disturbances that the chariot first appeared in Libya; hence, the first southward burst of horse-nomads may have affected both shores of the Mediterranean, whatever languages they brought with them.

The dates of the earliest certain appearances of Indo-European are about 1900 B.C., when the Našili dialect which was incorporated into Hittite entered Asia Minor. The earliest Greek probably entered Hellas at the same time. About 1400 B.C., the ancestors of the Aryans of India were crossing the passes of Afghanistan into the Indus Valley, and some six hundred years later, their relatives the Iranian ancestors were founding

[10] That headed by Kossinna, who would likewise derive Indo-European speech from the Baltic. See Kossinna, G., *Ursprung und Verbreitung der Germanen.*

[11] Nehring, A., **WBKL**, vol. 4, 1936.

[12] Whatmough, J., *The Foundations of Roman Italy.*

[13] Sapir, E., **JAOS**, vol. 56, 1935, #2, pp. 272–281.

the Persian empire. From roughly 1000–900 B.C. onward, as the earliest possible date, the bearers of the Hallstatt culture in central Europe were spreading the use of iron, and the Hallstatt people almost certainly spoke Illyrian. In Italy, the Villanova people were without reasonable doubt diffusing Italic speech in the peninsula, while some forms of Illyrian were introduced by a number of peoples, among whom were probably the Veneti.

All of these Indo-European speakers, from 900 B.C. onward, were associated in some way with the diffusion of iron metallurgy from a center which is still to be determined. The most commonly proposed location is northern Anatolia and the Caucasus; [14] whatever the history of the diffusion of Indo-European speech in the past, with the advent of iron, certain branches of it seem to have spread with great rapidity. The Hallstatt period in central Europe was followed by that of La Tène, the Late Iron Age, which lasted from 500 B.C. to the time of Christ; and this was the period of Keltic expansion and Keltic dominance, earlier than but parallel to the spread of Roman power and of Latin in the Mediterranean. After the phenomenal and immoderate scattering of the Kelts, who were destined to survive linguistically only on the western European fringe, far from their center of dispersion—the Germanic peoples began, in the days of the Roman empire, their swelling and pushing, from Denmark, southern Sweden, northern Germany, Holland, and the Norwegian coast. This reached every country in Europe and also North Africa. Unlike the spread of the Kelts, it was to achieve, in many quarters, linguistic and cultural permanence.

The expansion of the Germans was followed by that of the Slavs, the youngest of the Indo-Europeans to effervesce in an orgy of numerical increase and of migration. This took place in full historic time, in the seventh and eighth centuries of our era, but, unfortunately, the light of history was dim in the part of Europe in which most of their expansion occurred.

The foregoing digression into the field of comparative linguistics has a direct bearing upon the problem of the racial complexion of present day Europe. While it is not our primary purpose to discover the physical type or types of the undivided Indo-European ancestors, if they were ever actually undivided, it will be possible to find the common racial denominator, homogeneous or mixed, of the Iron Age spreaders of Indo-European speech and the accompanying cultures over Europe and parts of Asia. Once we have isolated the common factor, we may hope to locate its position in the roster of racial types previously known to us—for it must have been some type or types with which we have already become

[14] Wainwright, G., **Antiquity**, vol. 10, 1936, pp. 5–24.

familiar in the earlier part of our study, and not a *deus ex machina* conjured up by linguists and politicians.

(2) THE ILLYRIANS

In beginning our survey of Iron Age Indo-European peoples, it may be well to choose the earliest instance in which we can definitely identify a language with a culture and a racial entity. This is true of the so-called Hallstatt culture associated with the Illyrian branch of Indo-European speech. Although usually classified with Centum, Illyrian, like Tokharian B, belonged to an ancient form of Indo-European which perhaps antedated the clear segregation into Centum and Satem.[15]

This culture arose in central Europe, with southern Germany and Austria as a focus, sometime shortly after the beginning of the first millennium B.C. It developed out of local Bronze Age origins carried over from the Urnfields, and in turn from Aunjetitz. Other Middle and Late Bronze Age influences reached it, particularly that of the tumulus culture of the south German highlands; likewise both cremation and the use of iron were introduced from outside. Still, whatever the complexity of archaeological detail, the Hallstatt civilization may be considered primarily the work of the indigenous central European population, with little if any accretions.

The Hallstatt culture spread in many directions, including the southeast, where it penetrated Bosnia, and eventually Albania. It moved slowly northward, until it reached the Scandinavian and North German area, bringing iron to these regions relatively late; while to the southwest, it crossed France and penetrated Catalonia. To the immediate south, it likewise spread over the Alps into Italy, where the invading Illyrians split into a number of local tribal groups, including the Veneti. It would be foolish to claim that every site with Hallstatt cultural remains carries the bones or ashes of Illyrian speakers. This may only with certainty be asserted for the central area, and for the regions immediately adjacent, while in the west it is fairly certain that some of the peoples in a Hallstatt level of culture were actually Kelts.

The Hallstatt crania from Austria, including those from the type site itself, form a reasonably homogeneous, entirely long-headed group.[16] (See Appendix I, col. 32.) This group is the legitimate, local successor to the Aunjetitz, and like the latter it resembles the Danubian Neolithic

[15] Whatmough, J., *The Foundations of Roman Italy*, p. 177.

[16] Through combining several series, 24 adult male crania may be assembled.
Hochstetter, F. von, **MAGW**, vol. 7, 1878, pp. 297–318.
Rosensprung, L. M., **MAGW**, vol. 66, 1936, pp. 338–344.
Schliz, A., **AFA**, vol. 37, 1910, pp. 201–251.
Schurer von Waldheim, Hella, **MAGW**, vols. 48–49, 1919, pp. 247–263.
Weisbach, A., **MAGW**, vol. 18, 1888, pp. 51–52.
Zuckerkandl, E., **MAGW**, vol. 13, 1883, pp 89–118.

series in many respects. In certain characters, however, it leans in a Corded direction, and these include a heightening of the orbits and a narrowing and lengthening of the nose. Certain of the individual crania are of definitely Corded type. Morphologically, as well as metrically, most of these skulls may without difficulty be designated as "Nordic"; the browridges are moderate, the foreheads moderately sloping, the occiputs protruding, the parietals flattened, the malars compressed, the mandibles deep. The stature was apparently moderately tall.[17]

The Austrian Hallstatt series has close connections in two directions: first, with the local Bronze Age and Neolithic populations of central Europe which preceded it, and second, with the Germanic "Reihengräber" people who followed it after a Keltic interruption. The similarity between Hallstatt and Germanic crania is a commonplace; and if the Reihengräber people were "Nordic," as is generally conceded, then so, in all likelihood, were the Hallstatt people.

The significance of this double continuity is great. It traces the Nordic racial type, in its skeletal form, back to the Early Iron Age, and derives this with little alteration from the preceding Age of Bronze. The Bronze Age population which was thus the ancestral Nordic one was in turn derived from a mixture between the local Danubian Neolithic people, who came from the east, and the later Corded invaders. The complexity of the Middle and Late Bronze Age, therefore, and the disturbances caused by the introduction of cremation, during the latter part of the epoch, did not interrupt the racial continuity of central Europe, where racial movements, during the Late Bronze Age, seem to have been somewhat simpler than those of culture.

Let us return to the specific problem of the Illyrian racial composition. So far, we have been dealing entirely with the Hallstatt remains from Lower Austria. The Hallstatt cemetery itself dates from the middle and later thirds of the period; but the neighboring Early Hallstatt site of Statzendorf, from which a series of five crania have been taken, contains nothing but long-headed examples, and these are the same as those from the type site itself. So the Hallstatt site is racially typical of the entire period.

When we move to southern Germany, however, which was equally involved in the development of this culture, we find no such racial uniformity. Crania from Württemburg, Bavaria, and the Bavarian Palatinate include, with the usual Austrian Hallstatt type, a large minority of brachycephals which may be considered as survivals from the Bronze Age.[18]

[17] Matiegka, H. (**MAGW**, vol 41, 1911, pp. 348–387), fails to segregate Hallstatt from Aunjetitz long bones, implies that both are the same, with a mean stature of 168 cm.

[18] Schliz, A., **AFA**, vol. 37, 1910, pp. 202–251.
Schultz, B. K., **VGPA**, vol. 3, 1929, pp. 5–12.

These include both planoccipital crania of the original Bell Beaker type, and a curvoccipital brachycephalic type which shows a Borreby relationship. It would appear, then, that in southwestern Germany, Hallstatt Nordics had invaded the region and had mixed with the Bell Beaker Dinarics and the old Borreby sub-stratum.

A large series from the Spreewald, situated to the north of this area and on flat land, consists entirely of purely dolichocephalic crania of the regular Austrian Hallstatt type,[19] which was apparently at home in the lowlands of central Europe, but not in the highlands, which had already given shelter to a tenacious brachycephalic population. In Bohemia and Silesia, as one would expect, Schliz finds typical Hallstatt dolichocephalic forms in small collections from each of these regions. One out of five Bohemian crania was brachycephalic, and none in a series of four from Silesia.

The generalization announced in the preceding paragraph applies likewise to Switzerland, where the Hallstatt culture, like that of the Bronze Age, penetrated slowly, while the older economy and technique which had survived in part from the Neolithic persisted in large measure. Both long-headed skulls and those of brachycephals are found, as is to be expected. In the available Swiss Hallstatt material, the majority of crania are brachycephalic.[20]

Let us turn southeastward and follow the Dinaric Alpine chain in the direction of the Balkans. In the mountainous section of southern Austria, the Hallstatt Nordic type is in the minority. Out of six skulls from Carniola, three are round headed and one is mesocephalic. The brachycephalic types seem without question to be predominantly Dinaric. In Croatia, however, seven adult skulls are all long headed, of the usual Hallstatt type, while two infantile skulls show brachycephaly.

In Bosnia, we come to the famous site of Glasinac,[21] where a comparatively large series of relatively late Illyrian remains contains again a mixture of types. The majority of the skulls are long headed and these show the same mixture of Danubian and Corded elements which we have already seen at Hallstatt itself. A few of the individual crania are very large, and reproduce the Corded prototype quite accurately. The brachycephalic skulls, although in the minority, are numerous enough to permit one to determine their racial affiliation with some accuracy. Almost all

[19] Götze, A., **PZ,** vol. 4, 1912, pp. 264–350. This cemetery, unfortunately, was used at two periods; from 1000 to 500 B.C. when it was a Hallstatt graveyard, and from 500 A.D. on, when it was occupied by Slavic Wends. It is impossible to state how many of the crania belong to the Hallstatt people, and how many, if any, to the Slavs, but in either case the series represents one unified physical type of Hallstatt affinity.

[20] Schlaginhaufen, O., **VNGZ,** vol. 79, 1934, pp. 220–270.

[21] Weisbach, A., **WMBH,** vol. 5, 1897, pp. 562–576.

belong to what might be called a modern Dinaric racial type. The skulls are moderately large with flattened occiputs, straight side walls, rather broad foreheads, and a very prominent nose, in the one instance in which the nasal bones were preserved.[22] The jaws are very broad with an excessive bigonial diameter, but not noted for their depth.

Metrically, these brachycephalic crania resemble the Bronze Age series from Cyprus, but are, on the whole, a little larger. They fall, as a matter of fact, into an intermediate position between the Cyprus series and the Bell Beaker group from the upper Rhineland, but in morphology are identical with both. There is no doubt that we are dealing in this instance with a form of Dinaric which anticipates the modern population of Bosnia.

This is the first occurrence of crania of this type in the Dinaric Alpine region in any considerable numbers. We have already seen, however, that this same type had entered these mountains by the beginning of the Bronze Age, in connection with the eastward movement of the Bell Beaker peoples. The round-heads at Glasinac and in Carniola may have been the descendants of these Bell Beaker refugees. It is also possible that this racial type may have been reënforced by migrations from the southeast, but there is no archaeological evidence to favor such a theory.

As the Illyrians spread southwestward along the Dinaric Alps into Montenegro and Albania, they apparently blended with an indigenous brachycephalic mountain population which may have been more numerous than the invaders; for, with some additions and modifications, it persists as a predominant element today. In a small series of early Christian crania from a site near Split on the Dalmatian coast,[23] both Dinaric brachycephals and a few long-headed crania are represented. In Albania, a country which is almost completely unknown archaeologically, a single skull which belonged to a Romanized Illyrian group has been found in an Iron Age site in the tribe of Puka.[24] This skull is mesocephalic, and seems, insofar as we may judge, intermediate between the Illyrians of the old type and Dinarics.

The significance of our study of the Illyrían peoples is as follows: on the plains of south central Germany and Lower Austria, where the Hallstatt culture arose, the racial type involved was skeletally a Nordic one. By this term we must understand that the Illyrian central type was similar in cranial dimensions, proportions, and general form to that of the Germans of the Völkerwanderung period. Historical evidence as to the pigmentation of the Illyrians is conflicting,[25] and insufficient to warrant the

[22] In all of the Glasinac crania the facial bones are missing
[23] Horvath, A., **MAGW**, vol. 36, 1906, pp. 239–248.
[24] Lebzelter, V., **AFA**, vol. 45, 1919, pp. 143–146.
[25] Lebzelter, V., **MAGW**, 1929, vol. 59, pp. 61–126.

formation of an opinion on this matter. This "Nordic" type is no special or separate race, but merely a variant of the larger Mediterranean family, of an intermediate metrical position.

It finds a ready prototype in the Bronze Age population which stretched from Austria to Siberia, and which was in turn the product of mixture between Danubian peasants and Corded invaders. It seems most likely that the Illyrians were largely the descendants, more specifically, of the Aunjetitz people, through an Urnfields medium, or of some similar physical blend composed of identical racial ingredients.

(3) THE KELTS

One of the most controversial subjects in the whole of European history is the physical composition of the Keltic peoples. The name Keltic has been applied to many racial types, real and imagined, from short, brunet, round heads to blond brachycephals and Nordics. Many modern prehistorians take the stand that the Kelts were everywhere a small minority of aristocrats and conquerors, and that no special racial type accompanied their expansion in Europe. This position, however, becomes invalid when we examine the actual skeletons of Keltic speakers. There *was* a Keltic physical type, which the Kelts carried to their primary areas of colonization, and which will be described shortly.

Although earlier identifications, however likely, are still questionable, we may state that the Kelts as such first appeared in the European historical setting about the year 500 B.C., with the beginning of the La Tène civilization. The home of the Kelts, or at least the country in which they developed this brilliant Iron Age culture, lies without reasonable doubt in southwestern Germany, in the upper drainage of the Rhine,[26] a country which had formed the western section of the original Hallstatt area. The easternmost outposts of the early Keltic domain were Bohemia and Galicia, while, on the west and south, it touched the territory of the Ligurians and of the Rhaetians. The Kelts, therefore, were situated northwest and west of the Illyrians proper, and south of the Germans, who at the time were confined to Scandinavia and northwesternmost Germany.

The Keltic languages are very closely related to the Italic group, of which Latin was a derivative. The period in which the Keltic languages became differentiated from other forms of Indo-European speech must, therefore, be as old as the departure of the ancestors of the Italici for Italy, and therefore must lead back to the Bronze Age.[27] Keltic, like Italic, is divided into two branches—P-Keltic and Q-Keltic. It is considered likely

[26] Hubert, H., *The Rise of the Celts*, p. 147.

[27] Although one school of Italic scholars derives the P-Italici from north of the Alps in Iron Age times, all admit the Bronze Age dating of the Q-Italic arrival. For the details of this controversy, see Whatmough, J., *The Foundations of Roman Italy*.

that the phonetic separation which split both of the linguistic groups took place independently in each, and that the tendency for such a division was inherent in both Keltic and Italic at the time of their separation from one another. We do not know at what time the Goidelic or Q-Keltic dialect split off from the Brythonic or P dialect, but this cleavage again must have occurred at a reasonably early period, since the division was complete at the time of our earliest knowledge of these languages. Q-Keltic has survived only in Ireland, Scotland, and on the Isle of Man. All other known dialects, living and extinct, from Asia Minor to Wales, have been of the P variety.

The Keltic expansion, which began about 500 B.C., was a rapid and extensive one. The Kelts were an extremely mobile people who conquered and wandered far, and at the time of their expansion were apparently numerous as well. Their well-known migrations carried them over the Alps into Italy, down into southeastern Europe where they invaded Greece, and even over into Asia Minor where they established the short lived Galatian colony. Their main expansion, however, lay to the west. Belgium and northern France became great Keltic centers, from which some of them migrated down into northern Spain. This westward movement carried them also into the British Isles, where the Q-Keltic people settled Ireland, and their P-Keltic brethren established themselves in England and Wales. Large sections of Scotland were to remain free for the most part from these Keltic invaders until after the time of Christ, when the Goidels crossed over from Ireland.

The question as to the linguistic identity of the previous inhabitants, the Picts, is an open one. At present, the tendency is to consider them, and the pre-Goidelic Cruithni of Ireland, as speakers of some early form of Keltic. The further question as to whether or not the Goidels crossed England in their journey to Ireland is likewise open, but the prevailing tendency is to bring them over the old sea road from northern Spain, which they had previously entered by way of France, and to deny that they sojourned in England at all.

In their period of development in southwestern Germany, the relationship between the Kelts and Illyrians must have been intimate, for the Kelts received iron from a Hallstatt source, and were actually, during the Early Iron Age, participants in a Hallstatt form of culture. The major factor which served to differentiate La Tène from Hallstatt culture was the incorporation, by the former, of many elements derived from the classical Mediterranean world. The Kelts were situated at a favorable spot for the reception of such influences; Greek influences moved up the Rhône and Saône from Marseilles, while those from Rome crossed the Alpine passes into Bavaria and Switzerland and thence into the Keltic homeland,

In addition to the Hallstatt Iron Age base and classical accretions, we must further acknowledge the influences of some eastern European grassland culture, for the Kelts rode astride as well as in chariots, and the P-Kelts introduced trousers to western Europe. This garment was central Asiatic in origin, and was typical of the Scyths, whose period of cultural efflorescence in the east was contemporary with and parallel to that of the Kelts in the west. Philologically, there are a number of close linguistic connections between the Kelts and the Indo-Iranians, which may reflect this or an earlier cultural contact. It is most likely, however, that the principal contact between the Keltic-speaking peoples and the Iranian horsemen of the eastern European plain took place during the early years of the great Keltic expansion.

Turning back from Keltic expansions to Keltic origins, we find no cultural disturbances in southwestern Germany which would permit the arrival of the Kelts from elsewhere between the Hallstatt epoch and the early La Tène. Before the Hallstatt, however, the spread of the Late Bronze Age Lausitz culture into this region from eastern Germany may conceivably have brought a large number of people, impossible to identify because of their practice of cremation. These people may well have been the bearers of Keltic speech. Since the related Italici were themselves Urnfields cremators before they succumbed to indigenous burial rites in Italy, this identification is rendered more than likely. Hubert has, indeed, postulated an earlier Ligurian-speaking population in the Keltic cradle-area.[28]

The derivation of the Kelts from a Hallstatt cultural horizon, in part of the earliest region of Hallstatt development, while the main current of Hallstatt cultural expansion was borne by Illyrian speakers, seems incongruous. One must remember, however, that the Nordic skeletal type with which the Illyrians were identified in Lower Austria was confined, in its purely dolichocephalic form, to the lowland country north of the Bavarian foothills, while the Keltic area of development was, in its strictest limits, within the highland zone. Here the Kelts developed their own culture independently of the Illyrians and retained their own language.

Keltic cranial material from the southwest German center of Keltic development is surprisingly scarce. Schliz has described six skulls, and notices of three others have appeared in more recent publications.[29] Of these nine, one is dolichocephalic, four are mesocephalic, and four are brachycephalic. Although this small group is far from sufficient to disclose the racial type of the Kelts in their homeland, it is enough to show us that a round-headed element played a considerable part in the develop-

[28] Hubert, H., *The Rise of the Kelts*, p. 159.

[29] Jacob, G., **AFA**, vol. 20, 1891–92, p. 181.
Ortmann, R., **JVST**, vol. 15, 1927, pp. 56–59.
Schliz, A., **AFA**, vol. 37, 1910, pp. 246–251.

ment of this ethnic group. The brachycephals involved are large headed and powerfully built, with long faces, and rather high orbits; the foreheads are sloping and only slightly bowed at the junction of the facial and cranial planes. The inference is that these brachycephals were derived from the older combination of Bell Beaker and Borreby types which was formed in the upper Rhine country at the beginning of the age of metal, and which persisted into the Hallstatt period. These seem to have mixed with the expected intrusive Nordics. We must really wait until we examine larger series of Keltic crania from elsewhere, however, before passing judgment on the final result of this blend.

A better picture of the La Tène type may be obtained from the study of its early eastern extension. Hellich's series from Bohemia [30] (see Appendix I, col. 33) is the only single group of central European La Tène crania of any consequence. This includes 27 male crania, most of which are dolichocephalic, but which contain a significant minority of brachycephals. In general, the La Tène skulls are not in any important metrical way distinguishable from those of the preceding periods of which we have clear knowledge—that is, Aunjetitz and Hallstatt. They represent merely a subvariety of the same general combination of types, with a brachycephalic accretion which makes the total series mesocephalic.[31] But there are other features, however, which render them as a group slightly different; the vault has a tendency to be low in proportion to its breadth, and the upper face is long in proportion to the total face, for the Keltic jaw, although broad at the gonial angles, is not as deep as that of other Iron Age Nordics. A composite series of eleven male crania from the type site of La Tène on Lake Neufchatel in Switzerland, and nearby burial places,[32] is almost exactly the same as the Bohemian series; the vaults of the Swiss La Tène people, who may in part be identified with the Helvetii, are even lower than those of the Bohemians. As one might expect, the Swiss series contains a number of high brachycephals, with cranial indices as high as 90; [33] but on the whole, most of the few Kelts whose remains have been studied in Switzerland were no different from those in Bohemia.

Less than a dozen skulls serve to identify the Keltic racial elements in Austria and in the Dinaric Alpine mountain zone.[34] On the whole, this

[30] Hellich, B., *Praehistoricke lebky v Čechách ze Sbírky Musea Království Českého.*

[31] Schliz's series of 14 crania from Bohemia, 3 from Moravia, and 2 from Silesia do not differ from those measured by Hellich. Schliz, A., **AFA,** vol. 37, 1901, pp. 246–251.

[32] Virchow, R., **ZFE,** vol. 16, 1884, pp. 168–181; *ibid.*, vol. 18, 1886, pp. 561–566.
Lagotala, H., **BMSA,** ser 7, vol. 3, 1923, pp. 4–9.

[33] Schlaginhaufen, O., **AFSA,** N. F. Bd. 38, 1936, pp. 226–236.

[34] Pöch, H., **MAGW,** vol. 56, 1926, pp. 255–270.
Lebzelter, V., **WPZ,** vol. 22, 1935, pp. 104–105.
Luschan, F. von, **MAGW,** vol. 8, 1879, pp. 85–89.
Schliz, A., *loc. cit.*

evidence is not satisfactory, but it serves to indicate that the regular mesocephalic type and one or more types of brachycephals were present. The most southeasterly Keltic skull known is one from Kupinovo, near Belgrade in Serbia, which belonged to a Dinaric brachycephal similar to those found at Glasinac, and this again witnesses the persistence of this Dinaric element during the Iron Age in or near the modern Dinaric area.

Before turning to the abundant remains of the Kelts in France and the British Isles, it may be well to review what evidence we have for their racial type in central Europe. Here the Kelts seem to have been a composite people, a blend of the different brachycephalic elements left over from the Bronze Age in the mountainous zone of southern Germany, and invaders of Nordic type from the plains to the north and east. One supposes that the Keltic linguistic element came with the later group.

Sculpture from Greece and Rome gives us a picture of the living Kelts who reached the lands of classical civilization by eastward and southward movements. The well-known Dying Gaul and similar statues show a strongly muscled type with mesocephalic or brachycephalic head form, a rather short face with a square jaw, a straight and rather prominent mesorrhine nose, with horizontal or elevated tip and full nostrils, heavy browridges, a broad forehead, and stiff, bristly hair. This type, while familiar enough in western Europe, is not one which accords with the majority of the Keltic skeletons. The typical Keltic face was long in the upper portion, shallow in the mandible, long and narrow of nose, often with a convex profile, and the forehead was extremely sloping and the vault low. This has its most frequent counterpart today in the British Isles. While the type selected by the classical sculptors to represent the Kelts must have had its living models, these may have been drawn from the brachycephalic minority.

Most of the La Tène material from France comes from the north, from the Marne region, where the Keltic settlement seems to have been particularly strong. Fortunately, large and competent series of the Gauls of this district, before and after the Roman conquest, furnish adequate information.[35] (See Appendix I, col. 34.) Both groups are alike, showing that submission to Roman rule did nothing to change the physical type of this particular people.

The Gauls as so represented were mesocephalic, mesoprosopic, and on the upper borders of leptorrhiny. The vault, as with all characteristic La Tène Keltic groups, is not distinguished for its height, and in the large

[35] Raymond, P., **RP**, vol. 2, 1907, pp. 10–22, includes 20 males.
Wallis, Mrs. Ruth Sawtell, unpublished measurements in Musée Broca, École d'Anthropologie, and Musée d'Histoire Naturelle. Includes 28 pre-Romans and 83 Gallo-Romans, all males.

and more reliable post-Roman series, it is definitely low. Like their relatives in central Europe, these Gauls were not noted for tall stature; a mean of 166 cm. is only moderate.

In other parts of France, the Keltic racial continuity was of variable intensity; in Lorraine and Beaune,[36] the usual type was found; but in Haute Savoie and Vendée the earlier brachycephalic population is strongly represented in Keltic tombs,[37] while out on the tip of Brittany, Neolithic survivors of Mediterranean type, with perhaps some Gaulish admixture, persisted until the period of Roman conquest.[38] Only in the north, therefore, did the Kelts make a firm imprint in the early population of what was to become the French nation.

The Kelts in the British Isles are known to us by a large series of Brythonic crania from England and southern Scotland, assembled by Morant[39] (see Appendix I, col. 35); these are three millimeters longer headed than the Bohemian and Swiss series, but nearly identical in vault dimensions with the French; facially they are the same as all of the others. Smaller collections of Goidelic crania from Ireland show the skulls from this country to be exactly the same as those from Great Britain.[40] Several morphological features distinguish these skulls, of the typical, or mesocephalic, group—which in the British Isles seems largely to lack the brachycephalic minority which accompanies the main type in central and eastern Europe. The forehead is quite sloping; the vault, when seen from behind, gives a cylindrical impression, rather than that of a rhomboid or rectangle, as with other Nordic crania. The upper face is quite long, the mandible wide at the back, and relatively shallow. The nose is often very prominent.

The skeletal material from Ireland (see Appendix I, col. 36) is not numerous enough to permit regional studies, or other statistical niceties; but in Great Britain there are, on the contrary, a number of local series sufficient to show that the racial complexion of that island was not, during the Iron Age, completely uniform. One of these, that of the erroneously named "Danes' Graves" at Driffield, Yorkshire,[41] containing 29 male crania, is identical in every known respect with the Aunjetitz skulls from central Europe—a pure (if the adjective pure may be used of a composite type) Hallstatt or Nordic local population; purely dolichocephalic, in contrast to the usual Keltic mesocephaly; and relatively high-vaulted,

[36] Hamy, E. T., **Anth,** vol. 17, 1906, pp. 1–25; vol. 18, 1907, pp. 127–139.

[37] Baudoin, Marcel, **BSAP,** vol. 6, 1912, pp. 321–346.

[38] Vallois, H. V., *Les Ossements Bretons de Kerné, Toul-Bras, et Port-Bara.*

[39] Morant, G. M., **Biometrika,** vol. 18, 1926, pp. 56–88. Also Hooke, Beatrix, and Morant, G. M., **Biometrika,** vol. 18, 1926, pp. 99–104.

[40] Martin, C. P., *Prehistoric Man in Ireland.* Twelve Iron Age skulls are listed.

[41] Wright, W., **JRAI,** vol. 33, 1903, pp. 66–73; **Archaeologia,** vol. 60, 1906, pt. I, pp. 313–324.

Mortimer, J. R., **Man,** vol. 9, 1909, pp. 35–36.

again non-Keltic, although the stature, 167 cm., is presumably no different from that of the Kelts.[42]

It is impossible to derive this group from the local Neolithic, which was noted for its extreme absolute cranial length; or from the dolichocephalic element of the Bronze Age, which was again larger, longer, and higher skulled; it resembles not only the earlier Aunjetitz and Hallstatt, but also, although to a lesser degree, the contemporary Scandinavian Iron Age people in the period immediately before the Germanic Völkerwanderung. All of the archaeological material found in the Danes' Graves has never been satisfactorily identified.[43] Although the dominant Keltic tribe of that neighborhood, the Parisii, seems culturally represented, it is unlikely on archaeological as well as on racial grounds that the majority of the men buried in these graves came from the Marne, whence the usual Brythonic tribes migrated to England. Two of the fibulae found in the scanty remains have Scandinavian affinities; despite this clue, however, we must leave open the question of the immediate origin of the Danes' Graves people, and render the verdict: "Central European Nordics found in Yorkshire during the late Iron Age, provenience unknown."

Another local group which shows aberrant tendencies is that of eleven male crania from Berkshire, of which the length, breadth, and circumference alone are available; [44] the figures are 193.3 mm., 149.6 mm., and 552.2 mm. The cranial index is 77. These mesocephalic crania are so much larger than those of the total Iron Age population that some other origin must be postulated. One recalls the extravagant dimensions of both Neolithic and Bronze Age crania in England, and may only suppose that this local group represents a relatively unaffected survival. Since both Bronze Age and Neolithic racial types may be picked out of any moderate-sized gathering of living Englishmen, or of their transatlantic relatives, it is not surprising to find a few in Berkshire during the Iron Age.

The descriptions of the Kelts, in Britain, in France, and in other parts of Europe, at the hands of classical authors, give us a definite picture of their pigmentation. Blondism was by no means characteristic of the Kelts as a whole. Rufosity was common, and the hair color was essentially mixed. Caesar himself noted the contrast between the ordinary Gauls and the partly Germanic Belgae, to whom he had to turn to find real blonds for his triumph. Furthermore, the Romans noted the Keltic practice of bleaching the hair to simulate a blond ideal, as in Greece.

[42] We know the stature of Kelts in the British Isles only from a small Irish group, and by inference from comparison with mediaeval English counterparts of Iron Age skeletons.

[43] Greenwell, W., **Archaeologia,** vol. 60, part 1, pp. 251–312.
Bremer, W., **Real,** vol. 1, pp. 229–230, article "Arras."

[44] Morant, G. M., **Biometrika,** 1926, vol. 18, pp. 56–98.

On the whole, the Kelts were a mixed group in race as in culture; their ancestry includes both long heads of some central European Nordic type, which was in turn a combination of several Mediterranean sub-types, and brachycephals from the region in southwestern Germany in which the Dinarics of Early Bronze Age introduction had blended with earlier round heads of Mesolithic origin. Out of this combination, the Kelts developed an easily identified national type, of considerable constancy, which was to be of some importance in the world, especially in Britain and the nations derived from her.

(4) THE ROMANS

Before proceeding to study the rest of the Iron Age Indo-European speakers in their homes north of the Alps, let us examine the racial position of those near linguistic relatives of the Kelts, the Italici, who lived south of that barrier, and who played a rôle of the utmost importance in the history of Indo-European speech. The racial problem in Italy is nearly as complicated as in Greece, but the recent work of Whatmough, paralleling that of Myres, makes its solution equally possible.[45]

We have already witnessed the accretion of various racial elements in Italy up to and through the Bronze Age. To a Neolithic Mediterranean sub-stratum were added tall, long-headed Megalithic invaders who came by sea, and Dinaric brachycephals from the eastern end of the Mediterranean. In the Late Bronze Age, Urnfields people crossed the Alps from the north, and settled in northern Italy. Some of them built the terremare settlements in the Po Valley, while their descendants or others like them were responsible for the Villanova settlements in the Bologna region, and similar sites as far south as Latium. These collective Urnfields peoples came from central Europe, rather than from the nearer Swiss center. The Italic languages, like Keltic, were without reasonable doubt introduced by the Urnfields people. Like Keltic, they split into P and Q forms, with Oscan and Umbrian as P, and Latin and Faliscan as Q. Latin itself, in its historic form, was a mixture of Villanovan Italic plus Etruscan plus some altered Greek, plus early Mediterranean words, including plant names.[46] The non-Italic accretions bear witness to the influences which met the early Romans, while its major Italic character throughout attests the persistance of the Romans in retaining the nucleus of their own speech through centuries of Etruscan overlordship.

We know comparatively little about the racial composition of the early Italic people in pre-Roman times. Two crania from Remedello [47] are

[45] Whatmough, J., *The Foundations of Roman Italy.*
[46] *Ibid.*, pp. 276–277.
[47] Zampa, R., **APA**, vol. 20, 1890, pp. 345–365.

both those of dolichocephals of moderate size; one of them, which is certainly a male, has a stature of 168 cm. Two early Romans [48] were likewise dolichocephals of the same size and proportions as many of the Nordic groups north of the Alps; while a third, from the pre-Republican cemetery of Corneto Tarquinia, which can be more accurately defined, resembles a small male series of eight Christian Roman skulls, dating from the first to fourth centuries A.D.[49] These nine male crania are identical metrically with the means for the La Tène Kelts in Bohemia, and the Gauls and Gallo-Romans of the Marne. The same mesocephalic, leptorrhine form is found in each case.

Historically, the Romans should have been a mixture of Villanovan Italic northerners with Etruscans and Neolithic and Bronze Age predecessors.[50] The little crania material at hand points entirely in the northern direction, and confirms the relationship between Kelts and Italici, insofar as it may be used. On the other hand, the addition of Etruscan mesocephals with Dinaric and Mediterranean elements would not greatly alter the early Kelt-like Italic metrical form.

The early Romans, judging from the busts of their descendants in the days of Augustus, and of descriptions, were not very tall, as a rule, but were often of heavy bodily build. Their skulls were flattish on top, and rounded on the sides, like those of Kelts. The facial features included the well-known "Roman" nose, which may have been partly derived from an Etruscan source. On the whole, the well-known sculptures of Caesar, Augustus, and others, although not reliable from the standpoint of accurate measurement, indicate that a mesocephalic to brachycephalic head form was admired. Their facial type is not native to the Mediterranean basin, but is more at home in the north. Nevertheless, the Romans considered the Kelts who invaded Italy tall and blond; hence the blondism of the Romans, including rufosity, must have been in the minority.[51]

More detailed information may be obtained by studying the remains of Romans who died away from home in the colonial service of the empire. For example, an officer of the sixth legion, named Theodorianus, stationed at York, came from the small city of Nomentum, in Latium. Three others, also buried at York, were also native Romans.[52] These four were all of one type, and very much alike: dolicho- to mesocephalic, with low vaults, low, broad foreheads, very aquiline noses, and short, broad, square faces. The

[48] Sergi, G., **ARAL**, Anno 280, 1883, 10 pp.
[49] Moschen, L., *Crani Romani della Primera Epoca Cristiana*, 1894.
Pröbstl, L., **AFA**, vol. 45, 1919, pp. 80–81.
[50] Whatmough, *op. cit.*, p. 267.
[51] Rochet, C., **MSAP**, vol. 3, 1868, pp. 127–145.
[52] Davis, J. B., and Thurman, J., *Crania Britannica*, 1865, Part II.

skulls of two other pure Roman officers from Bath and Gloucester are the same, as is one from Lincoln.[53]

A group of eight male Roman crania from Rheinzabern on the Rhine,[54] belonging to real Romans from Italy, are the same as the individuals from Britain, and almost identical with the eight males from Rome itself of the Christian period, and the early Roman from Corneto Tarquinia. These scattered references from various quarters, although few, are so alike that we must conclude that the Romans, however mixed, had formed a characteristic local or national physical type, which was mainly of Italic origin, and closely related originally to the Keltic.

The Italici, however, were not the only Indo-European speakers to invade Italy from the north. The Ligurians, of whom we have no certain skeletal remains, probably entered from Gaul, and may have been earlier than the Italici. On the eastern watershed of the Italian peninsula and in the Po Valley lived, in early protohistoric and historic times, various tribes of Illyrian speakers, notably the Veneti. To the Illyrian group may have belonged the people who buried in the cemetery of Novilara, on the central Adriatic coast,[55] about the eighth century B.C., contemporaneously with the Villanova people. The site belonged to a tribe called the Piceni, who in the seventh and sixth centuries developed a high culture and later declined, becoming subjects of Rome.

The doubt as to their ethnic origin may be partly dispelled by a knowledge of their physical remains. A series of eighteen male and thirteen female skulls is homogeneously dolichocephalic, with the low mean male cranial index of 71.2; the skulls are high-vaulted, narrow-faced, and leptorrhine. The series is very similar to those of Hallstatt Illyrians farther north, and the stature, 165.5 cm. for males, is tall enough to support this. Whether or not they spoke Illyrian, they were of Illyrian racial type, and the Illyrian invasion of northeastern Italy was undoubtedly a real one in the racial sense.

(5) THE SCYTHIANS

What the Kelts were to western Europe, the Scythians and their relatives became, at about the same time, to the treeless plains to the east. Riding astride, wearing trousers, and sleeping in covered wagons, they spread rapidly over the grasslands of eastern Europe and western central Asia, shifting so adroitly that Darius with his army could not catch them, and disappearing almost as rapidly from the face of eastern Europe as they had appeared. Like the Kelts, they were both dazzling and ephemeral.

[53] Browne, C. R., **PRIA**, vol. 2, ser. 3, 1899, pp. 649–654.

[54] Pröbstl, L., **AFA**, vol. 45, 1919, pp. 80–81.

[55] Whatmough is in doubt as to their linguistic affiliation. Whatmough, J., *op. cit.*, pp. 202–205.

But unlike the Kelts, their way of living, perfectly adapted to the grasslands on which they roamed, was destined long to survive their identity as a people.

About 700 B.C. the Scyths were first noticed in the lands to the north of the Black Sea.[56] Their domain reached from north of the Danube and east of the Carpathians across the fertile plains of eastern central Europe and southern Russia to the River Don. From this country they were supposed to have ousted the somewhat mysterious Cimmerians. Although the Don formed their eastern boundary, beyond it lived other groups of nomadic peoples culturally similar to the Scythians. These included the Sarmatians, their immediate neighbors to the east, who were, according to Herodotus, the result of a mass marriage of Scythian youths and Amazon maidens. The speech of the Sarmatians was said to be somewhat different from that of the Scythians, owing to the inclusion of Amazon words and an Amazonian manner of pronunciation. Beyond the Sarmatians lived the Massagetae, and beyond them the Saka. The word Saka, however, was used by the Persians as a general term, to include all of the nomadic peoples to the north of the Iranian plateau, in the two Turkestans.

In costume, in weapons, in methods of transportation, in living quarters, and in the totality of material culture, these people formed a continuous cultural zone from the Carpathians to China. It has been the custom to consider the Scythians a people of Asiatic origin who developed this high and specialized form of pastoral nomadism in central Asia and brought it with them to eastern Europe. Proponents of this school have suggested that the Scythians were a mongoloid people, and that they employed some Altaic form of speech. Another school holds that they were European in physical type, and spoke Iranian, while their cultural breeding ground lay somewhere to the east of the Caspian.

We do not know what language the Scythians spoke, nor is it likely that its exact affiliation will ever be definitely established. Their geographical position, however, and their association with the ancient Persians, makes the Iranian hypothesis very likely. This theory is further strengthened by the study of the language of the Ossetes, a living people of the Caucasus, who are supposed, on historical grounds, to be descendants of the Alans, a branch of the Sarmatians. Their language is definitely Iranian.

Although the general manner of living enjoyed by the Scythians does resemble in a remarkable degree that of the later Huns, Turks, and Mongols, one looks in vain for some of the cultural traits of these later Altaic

[56] The sources for the historical and cultural portions of this section include *Herodotus*, book iv, ch. 59–75; Hippocrates, *de Aere;* Minns, E. H., *Scythians and Greeks;* Junge, J. **ZFRK**, vol. 3, 1936, pp. 68–77; and Wm. M. McGovern's work, *The Early Empires of Central Asia*, which was consulted in advance of publication.

speakers which may be ascribed to a relatively recent Siberian origin. These include the yurt or collapsible felt-domed house, and the Turko-Mongol type of shamanism. The Turks and the Mongols, without question, took over almost completely the whole Scythian style of culture, but they added to it elements of their own which reflected their former habitat and manner of life. A few traits connect the Scythians with their neighbors to the north, the Finns; among these might be cited the sweat bath.

The Scythians proper possessed a type of feudal organization headed by a king, who ruled over four provinces each of which had local governors. These Scythian kings were all buried in a royal burial ground in the region called by the Greeks the Land of the Gerrhi, which was situated in the bend of the Dnieper River near Nicopol. No matter where the Scythian monarch died, his remains would be deposited, in a funeral chamber, with great ceremony and with an extravagant quantity of human sacrifice, underneath a huge mound erected for that purpose. The richness of the burials, and the wholesale suttee, are reminiscent of the ancient Sumerians, and of the early Egyptians. The eventual Sumerian origin of this Scythian custom is not unlikely.

This region of the Royal Scythian burying ground has been a source of great activity for both treasure hunters and archaeologists. The Scythians had a definite idea that this was the place in which their kings were naturally at home, and while it may not be wise to stress this point too much, it would seem that this location may have reflected their notions as to their original dwelling place, or at least that of their royal clan. Similarly, the Mongols in later times buried their dead in a restricted area in the Altai Mountains, which they considered holy ground.

During the first century B.C., the Sarmatians penetrated westward, crossing the Don, and driving the Scythians from their former homes. About 200 A.D., the Goths took the Scythian country from the Sarmatians, and in turn adopted much of the Scytho-Sarmatian culture, becoming great horsemen and learning to live in wagons. The Alans were the only branch of the Sarmatians to retain their integrity in face of this Germanic onslaught. They built up a great kingdom between the Don and the Volga, reaching as far as the Caucasus, including in it most of northwestern Turkestan. Between 350 and 374 A.D., the Huns destroyed the Alan kingdom. Some of the Alans went westward with the Huns, others accompanied the Vandals to North Africa, and a few, as previously mentioned, survive in the Caucasus as Ossetes.

Although these Iranians (if the Scythians and Sarmatians really were Iranians) were replaced by Altaic speakers in southern Russia, and throughout the breadth of their Asiatic domain, this process took some

time, and Iranian languages clung on for a long while in Kashgaria and in the oases of Russian Turkestan. Undoubtedly, the Scythians and their relatives were not destroyed, but were absorbed and reincorporated.

In studying the racial type of the Scythians, one must remember that they were not considered a homogeneous group by Herodotus, who is our chief historical source. They consisted of an inner clan called the Royal Scyths or True Scyths, who were the nobles and leaders, and, as a second element, the whole group of nomadic tribes of which the Royal Scyths were the integrating force. Herodotus also makes it clear that the Scythians kept many slaves. Only the Royal Scyths refused to own slaves, but employed youths of pure Scythian blood as bodyguards, and sacrificed these

FIG. 29. SCYTHIANS, FROM THE KUL OBA VASE.
Redrawn from Minns, E. H., *Scythians and Greeks*, p. 201, Fig. 94.

in their tombs. Thus, the Royal Scythian burial mounds must contain a relatively pure Scythian group.

One must not imagine that the Scyths and their slaves were the only inhabitants of southeastern Europe during the last seven centuries before Christ and the first two of our era. Herodotus mentions the agricultural Scythians, who were probably some earlier sedentary people or peoples who remained as underlings of the Scythians and their providers of cereal food. We must remember that much of the Scythian territory had been farmed as early as Neolithic times.

There can be little doubt, even before examining the skeletal evidence, that the Scythians and Sarmatians were basically if not entirely white men and in no sense mongoloid. The only definite description of them which we have from classical literature is that of Hippocrates, who called them white-skinned and obese, but this designation was employed by the father of medicine to prove one of his environmental theories. In later times, the Alans are described as having golden hair.

Fortunately, we are not limited to literary references. The Scythians themselves, under the influence of powerful Greek colonies on the north shore of the Black Sea, and particularly in the Crimea, produced a dis-

tinctive style of realistic art in gold repoussée. These representations include a number of portraits of Scythians in very realistic and life-like poses. They show a well-defined type of heavily bearded, long-haired men with prominent, often convex, noses. The browridges are moderately heavy, the eyes deep set. These faces are strikingly reminiscent of types common among northwest Europeans today, in strong contrast to those shown in the art of the Sumerians, Babylonians, and Hittites, which are definitely Near Eastern. The face, therefore, is definitely Nordic, while the body build looks often thick-set and very muscular, but this may be due to the clothing, which includes baggy trousers and jackets with full sleeves. The pointed caps which they wear and the long hair make it impossible to form a useful opinion of their head form, but this is unnecessary, since we may soon discover it from reference to the cranial material. Persian representations of Saka show exactly the same type, depicted by the followers of an entirely different school of art, and hence this type cannot have been an unfounded convention.

There is, in the anthropometric literature, sufficient data to permit the reconstruction of the Scytho-Sarmatian cranial type or types. The most extensive group, and that which may be used as a basic series, is Doniči's collection of seventy-seven Scythian crania from kurgans of Bessarabia, which was one of the favored Scythian pasture lands during the height of their domination.[57] (See Appendix I, col. 37.) The fifty-seven male crania of this series are not homogeneous, but fall into two types, a long-headed and a round-headed, with the former greatly in the majority.

The means of these Scythian skulls show them to be low mesocephals of moderate cranial dimensions, but with a low vault height. The cranial means are, in fact, almost identical with those of the Keltic series from France and the British Isles. They resemble the Aunjetitz and Hallstatt skulls only as much as the Keltic series mentioned resemble these latter. They are, furthermore, metrically identical with the previously studied skulls from the Minussinsk region of southern Siberia, which may have been contemporaneous with them.

One of the peculiarities of the Scythian skulls is a low mesene upper facial index, lower than that of the Kelts or of the Minussinsk people. Doniči has shown, however, that this low upper facial index is mostly associated with the brachycephalic element in the group, and the same is true of many of the chamaeconch and mesorrhine skulls. When the brachycephalic element is eliminated, therefore, one finds these skulls to be narrower faced, and narrower nosed, and to fit more nearly into a central European Nordic category. Other series of Scythian crania from southern Russia and from the Caucasus show the same general

[57] Doniči, A., *Crania Scythica*, **MSSR**, ser. 3, Tomul X, Mem. 9, Bucharest, 1935.

characteristics as that of Doniči's type series, but are in most cases purely dolichocephalic, which leads one to suppose that the brachycephalic element in the Rumanian skulls may have been at least partly of local origin.[58]

Other collections of Scythian crania vary in their mean cranial indices from 72 to 77. Those from the Kiev government, a Scythian center, have a mean of 73.[59] A series of eighteen Sarmatian crania from the Volga, although otherwise the same as the others, has a cranial index of 80.3.[60] However, one hesitates to consider this typical of the Sarmatians as a whole, since both the Alans [61] and the early Ossetes [62] were long headed. The former preserved the original Scythian Nordic type until the ninth century A.D.

Of especial interest is a rich kurgan in the Royal Scythian burial district,[63] near Alexandropol; this was one of the most imposing kurgans of Russia, not only for its size but for the quantities of gold placed with the dead king, and of animals sacrificed for his convenience. The kurgan contained five skulls in the primary interment; one of these was a large male of Corded type.[64] Another is a brachycephal with a vault especially wide behind, with a broad face and a narrow nose, resembling a Turkish or perhaps a Bell Beaker type; two are narrow skulls of the normal Scythian Nordic variety, while the fifth, that which occupied the king's chamber, is of moderate size, long headed, with a low vault, sloping forehead, a high, prominent nose, and wide flaring zygomatic arches. The malars are large, and there is, in this respect, a slight mongoloid suggestion. One may not, however, on this evidence alone, identify the Royal Clan with Turks or Mongols.

We know very little of the stature of the Scythians. Nine male skeletons from the Polish Ukraine, associated with crania of standard Scythian type, have a mean of over 170 cm.[65]

It is tempting to find the origin of the Scythians in the previous population of the southern Russian plain. A series of Bronze Age crania from the lower Volga region is identical, at least in indices, with the later Scythian group, and so is that from the Ukrainian Urnfields. Three

[58] Doniči is of this opinion. He finds the same brachycephalic type in a collection of skulls from an early Moldavian monastery.

[59] Debetz, G., Ann. Lab. Anth. Th. Vovk. Acad. Sc. Ukraine, T. III, Kiev, 1930, quoted by Doniči.

[60] Same.

[61] Jendyk, R., **Kosmos**, vol. 55, 1906, sec. 1–2.

[62] Ivanovsky, A. (after Doniči), **TILE**, vol. 71, Moscow, 1891.

[63] Baer, C. E. von, **AFA**, vol. 10, 1878, pp. 215–231.

[64] Another pronouncedly Corded cranium of Scythian origin was published by Majewski, E., in **Swiatowit**, vol. 9, 1911, pp. 87–88.

[65] Talko-Hryncewicz, J., *Przyczynek do poznania, Swiata Kurhanowego Ukrainy.*

skulls of so-called "Cimmerians" likewise show no important deviation.[66]

Furthermore, an important series of Early Iron Age crania from the Sevan district of Armenia, probably dated from the earlier half of the first millennium B.C., and probably therefore earlier than the Scyths in Europe, or at least as early as their first appearance, is exactly like the more dolichocephalic element in the Scythian group, and manifestly Nordic. The vault, like that of the Scyths, is low, the nose leptorrhine, the face leptene, with more compressed zygomata.[67] (See Appendix I, col. 38.) Morphologically, these Armenian skulls are characterized by a medium forehead slope, moderate browridges and muscular development; a moderately deep nasion depression, and straight or lightly convex nasal profile; a projection of the occiput which is most marked in the lower segment, and accompanied by some lambdoid flattening; a typical compression in the malar region. This series serves a double purpose: to show that a Nordic type entered into the modern Armenian blend, and to define the Iranian variety of Nordic which may have been likewise involved in the settlement of Persia and of India.[68] Furthermore, it is very similar, both metrically and morphologically, to the early Germanic cranial group, and this virtual identity draws together the two geographical extremes of an originally united family.

We have seen that the Scythians and Sarmatians, although they undoubtedly included in their ranks many individuals of different political affiliations, formed nevertheless a quite constant principal racial type, which was essentially Iranian and a form of Nordic. In its characteristic low vault, as in other dimensions, it specifically resembled the earlier eastern European and central Asiatic Nordic form. It was essentially a member of the racial cluster associated with the spread of Satem Indo-European speech in both eastern Europe and Asia.

(6) THE GERMANIC PEOPLES

We have already dealt with the expansions of two great Indo-European peoples, the Kelts and the Scythians, who, during the second half of the first millennium before Christ, nearly divided the European continent, north of the Alpine mountain barrier, between them. Other groups, such as the Thracians, who occupied large expanses of territory in the Balkans, have been neglected because of lack of information.

The first millennium of the Christian era witnessed two more such spreadings of Indo-Europeans; those of the Germans and of the Slavs, the former

[66] Stołyhwo, K., **Swiatowit**, vol. 6, 1905, pp. 73–80.

[67] Bunak, V. V., **RAJ**, vol. 17, 1929, pp. 64–87.

[68] Unpublished series of living peoples from the mountainous regions of the northern Punjab, and the Northwest Frontier Province, which will be published by Dr. Gordon T. Bowles, conform closely to the metrical and morphological specifications of this type.

to have lasting results in the west, the latter in the east. Unlike the Kelts and the Scyths, these two later groups, tardy to receive the civilization of the classical world, were destined to people many countries permanently with their descendants, and to implant their tongues in many regions.

Of these two, the Germanic expansion was the earlier. The period of Teutonic migration was that of the famous Völkerwanderung, which began with the precocious but futile invasion of Italy by the Cimbri and Teutons, who fought the Romans between 114 and 102 B.C., and which did not end until the adoption of Christianity by the Norwegians in the eleventh century put an end to the piratical practices of the Vikings. Its period of greatest vitality fell between the second and fifth centuries of the present era.

The home of the Germans before their expansion was only in a restricted sense the modern Germany. The tribes of which this people was composed occupied Denmark, southern and central Sweden, Norway, and the northern coastal strip of Germany, from the mouth of the Elbe to the Baltic shore. The islands of the Baltic near Sweden, namely Gotland and Bornholm, were densely populated.

One must not suppose that these early Germans were the unaltered descendants of their Bronze Age predecessors, for there is strong archaeological evidence that a new people entered Scandinavia at the beginning of the retarded Iron Age of this region.[69] The Hallstatt artefacts are entirely different in character from those of the Late Bronze Age, and the burial rite changed completely, while the old nature worship which the Megalithic sea people had brought to Scandinavia now disappeared abruptly, being replaced by religious phenomena which we can associate definitely with the classical Norse style of worship. The Norse pantheon, with its family of gods and its Valhalla, is closely related to the systems of Greece and Rome, of India, and of the other Indo-European divisions.

The principal civilizing agency in the development of the Germanic culture was that of the Kelts, but the Kelts were niggardly teachers, for they blocked the Germans from direct intercourse with the classical world. It was not until the days of the Roman Empire and of the Byzantines that the Germans, after driving their way through the vanishing Keltic domain, reached these civilizing influences. But the earlier Scandinavians had already possessed a distinctive Bronze Age culture, which was not entirely lost.

Furthermore, certain strong cultural elements in the time of Germanic efflorescence bore strong marks of an eastern inspiration; such as the ship burials, which resembled the Royal Scythian interments in every detail except for the substitution of ships for wagons; and the art, as expressed

[69] Shetelig, H., Falk, H., and Gordon, E. V., *Scandinavian Archaeology*, pp. 174–175.

in wood carving, which carried over the richness of the eastern animal style, and which reached its highest development in Norway. The Germans, like the Kelts, had been subjected to a very strong influence from the plains to the east.

Linguistically, the early Germanic tongues were much in the debt of the Kelts. Many of the words needed to express new things were of Keltic origin. Hubert, the Keltic authority, believed that the Germanic languages were the garbled borrowings of some Indo-European speech by a people to whom the Indo-European phonemes were difficult.[70] It is true that consonantal shifts from K to H, and the like, are more extreme than those in other Indo-European languages. It is very likely that the ancestral Germanic speech was introduced into Scandinavia by the invaders who brought the Hallstatt culture to that backward region.

It is the task of the physical anthropologist to help the archaeologist and linguist discover the identity of these Iron Age invaders, whose arrival in Scandinavia cannot be put back earlier than the sixth or seventh centuries B.C. This should be relatively easy, for the newcomers buried while the older population presumably continued cremating their dead. The Danish series is the most extensive, with 42 adult male crania[71] (see Appendix I, col. 39); of these only one has a cranial index of over 78. The series is strongly dolichocephalic, with a mean of 72.3. There is no trace of the brachycephalic element which had been so important in Denmark from the beginning of the Neolithic through the Bronze Age.

The Danish Iron Age crania form a homogeneous group. They belong definitely in the same class with the other Iron Age Nordics of Lausitz Urnfields inspiration, and more particularly the purely long-headed element in the Keltic blend, for the low vault and cylindrical transverse profile of the Keltic crania are also common here. Except for the lesser breadth of head and face, and greater vault length, they closely resemble the Keltic crania of Gaul and of the British Isles, and those of the Scythians, while they are virtually identical with the Armenian Iron Age skulls discussed in the last section. The Danish Iron Age crania, then, are probably the same as those of the ancestral proto-Kelts before their arrival in southwestern Germany, and of the ancestors of the Scythians and eastern Iranians. These Danes were a tall people, however, for the stature of 25 males was 171.5 cm. This agrees with that of the earlier peoples of the same region, and with that of the Scythians.

In this Danish series there was, without doubt, a selection on the basis of differential methods of disposal of the dead; the numerous Bronze Age

[70] Hubert, H., *The Rise of the Celts*, pp. 50–52.

[71] Nielsen, H. A., **ANOH, II Rakke**, vol. 21, 1906, pp. 237–318; *ibid.*, **III Rakke**, vol. 5, 1915, pp. 360–365. Reworked.

population, compounded of Megalithic, Borreby, and Corded elements, could not have disappeared completely. After the various elements in the Danish population have had time to blend, we shall see them reappear.

The Swedish population of the Iron Age, best represented by a smaller group of 14 males [72] (see Appendix I, col. 40), was essentially the same as that in Denmark. There are, however, a few differences—the vault is higher, the face wider, the upper face shorter. Perhaps these more peripheral Scandinavians showed a little of the older blood.

During the Iron Age, Norway was, for the first time, definitely settled by people comparable in civilization to those in Denmark and southern Sweden; it is likely that many of the earlier inhabitants of Jutland and the Danish archipelago had fled to the southwestern corner of that country, while other migrations came across from southern and central Sweden.

The most extensive Iron Age series from Norway is that of Schreiner, which contains 27 male crania.[73] (See Appendix I, col. 41.) These are quite different from those of either Denmark or Sweden. They are larger and much more rugged, with heavy browridges and strong muscular markings. Metrically, they approach the Upper Palaeolithic series of Morant; and they could fit easily into the range of the central European Aurignacian group. The Mesolithic crania of Stångenäs and MacArthur's Cave would not be out of place here. Yet in most dimensions, they fall a little short of the Upper Palaeolithic mean.

They are purely dolichocephalic, with a cranial index of 71.7. On the whole, they are just what one would expect from a Danish Iron Age—Upper Palaeolithic cross, with the latter in the majority, and this explanation agrees well with the archaeological data. The stature, 169.5 cm., fits both types. There is another possibility, however, that they had a strong Corded element. That some Corded blend entered into this mixture was indeed likely, but it is impossible to substitute the Corded for the Palaeolithic element, since the high vault of the former is not in sufficient evidence, and the faces of the Norwegians are wider than either Corded or Nordic.

The central coastal Norwegians of the Iron Age must have been in part true descendants of the Upper Palaeolithic people of central Europe, who moved northward and westward with the retreat of the last ice, and remained relatively undisturbed in the centers of its last melting until the arrival of new immigrants in the Iron Age. There must, however, have been regional differences of type in Norway at this time which persisted until the modern period; late Viking Age series from Jaeren, Tønsborg,

[72] Retzius, G., *Crania Suecica*, reworked.
[73] Schreiner, K. E., **SNVO, II**, #11, 1927, pp. 1–32.

and Skien [74] in the south show the presence of a brachycephalic type, massive in build and of great cranial size, which is metrically related to the Borreby group of Denmark and northern Germany. These may represent colonists or refugees from Denmark.

A late group from Sogn,[75] in the north, includes mesocephalic crania with extremely low vaults and smaller dimensions, associated with black or brown hair preserved in the graves. Metrically, they suggest modern Lapp crania in most respects, and serve to mark the northern Norse borderland, beyond which Norwegian settlements were, in the Viking period, only sporadic. These various series place Norway for the first time in history in the full light of physical anthropology, and show that the land of the Vikings was the last periphery of the Nordic world, in which ancient but fully evolved forms of humanity blended with the newcomers from the south and east.

Linguistically, the Germanic peoples who invaded other parts of Europe from Scandinavia and North Germany have been divided into two groups: East Germans and West Germans. The speakers of East Germanic included the Goths, Vandals, Gepidae, and Burgundians. The Goths claimed to have crossed the Baltic from Sweden (not from the island of Gotland) to the mouth of the Vistula. The Vandals and the Gepidae presumably had the same origin. From the Vistula, the East Germans expanded southward and eastward into the Scythian country, where the Gepidae seized control of Hungary, and the Goths finally established an important kingdom on the north shore of the Black Sea.

From here, the history of these tribes is well known. They all had important relationships with the Roman Empire, and adopted Christianity. The movements of the Goths into Greece, Italy, and France do not merit detailed description. The Visigoths pushed westward, occupied southern France shortly after 400 A.D., and moved down into Spain where they were gradually absorbed into the population of the northern provinces. The eastern Goths who fell under the rule of the Huns met a similar fate. Of a once numerous and mobile Gothic nation no trace remains. The same is true of the Gepidae, and of the Vandals, who went from eastern Europe to France, Spain, and North Africa, whence they were subsequently deported to Byzantium. No doubt, Gothic and Vandal blood flows in the veins of some modern Spaniards as well as of the peoples in other countries through which they passed. But this eastern branch of the Germans failed to make any lasting impression upon the racial map of Europe.

Although there is not much data concerning the physical type of these eastern Germans, there is enough to enable us to come to some definite

[74] Larsen, C. F., SNVO, #5, 1901, pp. 3–53. [75] *Ibid.*

conclusions. A series of Goths from the Chersonese north of the Black Sea, dated between 100 B.C. and 100 A.D., includes three male and eight female skeletons.[76] All of these are long headed, and they belong to a large, powerful Nordic type which reflects their Swedish origin, for they are no different from the Swedish Iron Age crania which we have already studied.

A later group of Gepidae dated from the fifth or sixth centuries in Hungary shows the persistence of this same type; despite historical blending with the Huns, of eight skulls at our disposal, all but three fail to show definite traces of mongoloid mixture, and in these three the non-Nordic traits are not manifested metrically. One is forced to the conclusion from this series, as from that of the Goths in the Chersonese, that the East Germanic peoples who took part in these wanderings preserved their original racial characteristics so long as they retained their political and linguistic identity.

The same conclusion results when one examines the Visigothic skulls from northern Spain which date from the sixth century A.D.[77] Here a series combined from several cemeteries shows us exactly the same Nordic type, with tall stature and with a high-vaulted skull, a long face, and a broad jaw; in this respect resembling, in a sense, the earlier Hallstatt crania, but more particularly those of the western Germanic group, especially the Hannover Germans and the Anglo-Saxons.

The western branch of Germanic-speaking peoples, while historically less spectacular, was destined to be far more important in the eventual peopling of Europe. This included the ancestors of the Anglo-Saxons, of the Frisians, and of the Germans proper. Among the latter may be listed the Franks, the Alemanni, the Bavarians, the Thuringians, and the Chatti, whose descendants are the Hessians. Under the Franks may be listed the ancestors of the Flemish- and Dutch-speaking peoples whose closely related languages are a mixture of low Franconian and Saxon elements. All of these peoples worked their way southward, and in some cases westward, gradually and without ostentation; the Alemanni to Switzerland and Austria, the Bavarians to the principality which bears their name, the Thuringians to Bohemia as well as to Thuringia, and the Franks to the upper Rhine country, Belgium, and France. The Burgundians, members of the eastern branch of Germans, sophisticated like the Goths from contact with the Roman Empire, crossed the Rhine ahead of the Franks, and occupied Rhenish Gaul at the same time that the Vandals were admitted under Roman sanction.

[76] Schliz, A., **PZ**, vol. 5, 1913, pp. 148–157.
[77] Barras de Aragon, F. de las, **MSAE**, vol. 6, 1927, pp. 141–186.
Pérez de Barradas, J., **MSAE**, vol. 14, 1935, pp. 141–172.

The prototype of the western German peoples who migrated from the region about the mouth of the Elbe is well represented by a series of skulls from Hannover which includes 41 male crania.[78] (See Appendix I, col. 42.) Metrically, these differ from the Danish Iron Age skulls in being slightly longer, somewhat broader, and considerably higher. The foreheads are broader, and the face is wider, and in many cases a bit longer. These skulls deviate from the normal Nordic type of central European origin with which we are familiar in their greater size and robusticity, and particularly in their greater vault height.

The skulls of the Anglo-Saxons who invaded England in the fourth and fifth centuries of the present era [79] (see Appendix I, col. 43) are almost identical with this Hannover group. It is to this same specific category that the Spanish Visigothic skulls to which we have already referred belong. To it must be added two series of old Frisians from northern Holland,[80] which are identical in every respect. The skulls of these old Saxons, old Hanoverians, and old Frisians differ in a number of ways from those of other Nordics which we have studied. They are larger than the Aunjetitz group and the Danes, and in fact any other series of Indo-European speakers that we have met, except the Norwegians. They lack the low vault and sloping forehead common to the earlier Nordics of Denmark, the Gauls, and the Scyths. The vault is moderately high; while the cranial index is on the border of dolicho- and mesocephaly. Compared with the other Nordics, the forehead is relatively straight, the browridges are greater, the muscular markings more pronounced, the cranial base wider, the face longer and somewhat wider.

The type represented by these three groups and by the Visigoths seems to be a variant of the Nordic type to which the early Indo-European speakers belonged. Its difference is one of size, and it appears to have attained this distinction through a mixture, in southern Scandinavia and Germany, between the older local population, consisting of a combination of Megalithic, Corded, and Borreby elements, and the purely Nordic Danish Iron Age group. The resultant typé approaches in some respects, but does not even approximate in size, the coastal Norwegian population which we have already studied, and it deviates far less from the central European Nordic than does the Norwegian group.

This physical type is accompanied by tall stature, of about 170 cm., and by a considerable heaviness and robusticity of the long bones. The bodily build was clearly heavier and thicker set than that of the previously studied Nordics. That it was characteristically blond is attested by the

[78] Hauschild, M. W., **ZFMA,** vol. 25, 1925, pp. 221–242.
[79] Morant, G. M., **Biometrika,** vol. 18, 1926, pp. 56–98.
[80] Reche, O., **VUR,** vol. 4, 1929, pp. 129–158, 193–215.

pigmentation of living examples as well as by numerous early descriptions. This type, being a mixed variety of central European Nordic combined with old northwestern European elements, is not a true Nordic in the sense in which the word has been used in this work, and its common and exclusive designation as Nordic in popular parlance as in scientific works is responsible for much of the confusion prevalent in the identification of that racial type today. Since it is found among both West and East Germans of the period of dispersal, it is essentially the Germanic or Teutonic racial type. The eccentric linguistic position of the Germanic peoples in the total Indo-European family has its racial connotations.

One of the principal outlets for this movement from the northwestern coasts of Germany was the Anglo-Saxon invasion of the British Isles.[81] This had begun by 250 A.D., when the Saxons raided the southern and eastern coast of England. It was a period of general turmoil, for Irish pirates were plundering the coast of Wales at the same time. The Romans were hard put to defend themselves against this double peril, and despite their military and naval precautions, the raids grew in volume and frequency.

In 406–407 A.D., large invasions of Germanic peoples crossed the Rhine and pillaged the Roman settlements in most of Gaul. This broke off communications between Rome and Britain. With Gaul out of Roman control, there could be no hope of holding Britain. Hence, in 409 A.D., the Emperor Honorius issued a decree bidding the inhabitants of Britain to shift for themselves in the future. From this point on the Saxons received little opposition, and settled in great numbers. Since the Saxons were not townsmen, they did not occupy the cities which they plundered, and the urban population established by the Romans in England maintained its identity for a century or longer before the towns were abandoned or became Anglicized.

The earliest Saxon contacts were Viking raids in which they not only pillaged the coastal settlements but also rowed far up the rivers, establishing temporary camps in the upper waters. When the main body of Saxons under Cerdic marched from the region of the Wash across Lincolnshire to the upper Thames Valley, the invaders found that other Saxons of more temporary habits had preceded them. Hence it is necessary, in studying early Saxon remains, to distinguish between mixed communities in which raiders had taken native women to wife, and pure Saxon settlements in which whole families and villages had emigrated at the beginning of the period of serious settlement.

The Saxons occupied, for the most part, empty country. This was because they were accustomed to low-lying land with a deep, rich soil, and

[81] Kendrick, T. D., and Hawkes, C. F. C., *Archaeology in England and Wales, 1914–1931.*

had formed, in their earlier home, the habit of tilling this in strips with deep ploughs drawn by eight oxen. The Kelts, whose agriculture was more cursory in character, preferred the uplands already made treeless by nature, and cultivated in square fields. They remained for the most part on territory frequented by the Bronze Age and Neolithic men before them. The Saxons, who liked forests as well as lowlands, cleared the marshes and river valleys of trees, and drained and planted them. Owing to this fundamental difference in methods of agriculture, the two peoples overlapped little at first, and the Saxons and Britons occupied adjoining territories in many parts of England for several centuries until at length the Saxon social and political domination submerged the language and culture of the earlier inhabitants beneath its own pattern.

The Anglo-Saxon skeletons which have been described earlier are derived from the graves of the heathen period, from the fifth to the end of the ninth centuries. The skulls from these graves [82] make a striking contrast to the Keltic Iron Age type which preceded them. While the Iron Age forehead is extremely sloping, that of the Anglo-Saxon skulls is rather steep and high, and the skulls which possess mandibles show that the Anglo-Saxon type was deep jawed, with a great distance from lower tooth line to chin and with a long, sloping ascending ramus. The cranium as a whole is steep sided with a well-rounded occiput, and frequently lambdoidally flattened.[83] The browridges are moderate to heavy. The nasal bones are highly arched, with often a considerable nasion depression. Muscularity of a pronounced character is indicated by deep pits and ridges on the long bones, which are thick and heavy. Compared with the Iron Age people, the Saxons were large bodied, and their more considerable body weight is correlated with a larger braincase. The mean stature of various series of Anglo-Saxons ranges from 167–172 cm.[84] and the total mean equals 170 or 171 cm.

Although there was a difference in the localities from which various groups of Anglo-Saxons came, little regional difference is manifest in the series from England. The Jutes who settled in Kent, and who came from the peninsula of Jutland, seem larger faced than the Saxons themselves, but the difference is actually slight.[85] In the total Saxon group studied

[82] Morant, **Biometrika,** vol. 18, 1926, pp. 56–98.
Brash, J. C., Layard, D., and Young, M., **Biometrika,** vol. 27, 1935, pp. 388–408.

[83] Lambdoid flattening is a characteristic common to Neanderthal and Upper Palaeolithic man, but rare in the exclusively Mediterranean group.

[84] Calculated from a number of series, involving over 120 adult males. Sources:
Beddoe, J., **JRAI,** vol. 19, 1889, pp. 2–11.
Duckworth, W. L. H., **PCAS,** vol. 27, 1926, pp. 36–42.
Hooton, E. A., **JRAI,** vol. 64, 1915, pp. 92–130.
Humphreys, Ryland, Barnard, etc., **Archaeologia,** vol. 73, 1923, pp. 89–116.
Mortimer, J. R., **Man,** vol. 9, 1909, pp. 35–36.

[85] Morant, *loc. cit.*

by Morant, both males and females belong to the same clearly differentiated type, and there is no confusion between them and the Iron Age form. They thus preserved their racial identity at least until the end of the eighth century.

A number of individual cemeteries, which date from the earliest period of Saxon invasion, give us a lively picture of the manner in which the first Saxon raiders and settlers operated. One of these is the graveyard at East Shefford, Berkshire, containing eight male and twelve female adults, as well as eight infantile and juvenile specimens.[86] All of the adult males thirty years of age or older represent a single type, the classical Saxon, and all are long headed. One of the females belongs to this same type, and she was buried differently from the other women, with horse trappings in her grave. The rest of the women were rounder headed, with cranial indices going up to 82.4, and some of them were planoccipital. They had wider, shorter noses, some prognathism, and shorter, shallower jaws. The adolescent women seem to be a blend of these two types. Although many of these differences may be due to sex and age, others, such as the fundamental head form, are clearly racial.

This cemetery presumably represents a raiding party which settled in the upper Thames waters before the onset of the mass invasions. It seems to have included less than twelve men and only one woman who were Saxons. The other women, being Bronze Age descendants, were apparently British wives of Saxon invaders, while the children were their offspring.

The excavation of a round barrow at Dunstable in Bedfordshire throws further light on the survival of the Bronze Age physical type into the Saxon period.[87] The primary burial of the barrow was a woman of the Early Bronze Age; secondary graves contained cremated bodies of the Middle Bronze Age, while tertiary burials, heaped in a ditch, consisted of one hundred skeletons of persons of the Saxon period who had apparently been executed, or slain in battle. One-tenth of them had their hands tied behind their backs when they died. Owing to the absence of grave goods, for these people were informally slaughtered in a ditch, it is impossible to tell exactly who they were. The view that they were Saxon settlers violently received by the natives is unsubstantiated. Judging by their racial type, they must have been natives slaughtered by the Saxons.

This series contains a hundred skulls, of which those of 52 males are suitable for study. This extensive series resembles the British Bronze Age means in most dimensions, but through the narrowing of the cranial vault, it indicates a certain degree of mixture with the Iron Age Keltic people.

[86] Peake, H., and Hooton, E. A., **JRAI,** vol. 45, 1915, pp. 92–130.
[87] Dingwall, D., and Young, M., **Biometrika,** vol. 25, 1933, pp. 147–157.

This excellent series, in agreement with that from Berkshire, proves conclusively that the Bronze Age people did not die out in England but kept on mixing steadily with the Keltic invaders and survived racially into Saxon times.

The Saxon invasions of the British Isles were followed by those of the Danes, who began raiding the British Isles in the eighth century. The Danes, many of whom were actually Norwegians, took the part of England in which the Saxons had become densely settled, but they also raided extensively in the north of Scotland and in Ireland. Very few skulls of these Danes are available for study, but they belong, almost without exception, to the expected northwestern Nordic variety.[88] Neither a series of six males from the Orkneys, nor of fourteen from various places in Ireland, differs from the type of the Saxons. The further Germanic invasion of the Normans, after their sojourn in France, took place in such late times that the remains of these Normans still repose in Christian cemeteries, and are subjected to the same restrictions which protect the skeletons of the solvent recently deceased from the hands of the anthropologist.

The West Germans who invaded Bavaria, southwestern Germany, northern Switzerland, and Austria, transformed previously Keltic and Illyrian regions into permanent areas of Germanic speech and culture. The tribes most fully responsible for this were the Franks, the Alemanni, the Bajuvars, and the Thuringians. The skeletons contained in the cemeteries used by these peoples during the first centuries of their settlement have been extensively studied, and it is not difficult to determine to what extent the Germanic type, as exemplified by the Hanoverians, Anglo-Saxons, and Goths was implanted in these regions.

The Bajuvars, the ancestors of the Bavarians, retained the original Germanic head form in their new home, with the cranial index mean of 75 to 76 in various series.[89] (See Appendix I, col. 44.) Their stature, about 168 cm., was moderately tall, and their cranial type, in most if not all metrical and morphological features, was reminiscent of their northern

[88] Bryce, T. H., **PSAS,** vol. 61, 1927, pp. 301–317.
Martin, C. P., *Prehistoric Man in Ireland*, pp. 150–151.

[89] Ecker, A., *Crania Germanica.*
Henckel, K. O., **ZFAE,** vol. 77, 3/4, 1925.
Hölder, H., **AFA,** vol. 2, 1867, p. 51.
Hüs and Rutimeyer, *Crania Helvetica.*
Kollman, J., **AFA,** vol. 13, 1881, p. 215.
Lehmann-Nitsche, R., **BAUB,** vol. 11, 1895, pp. 109–296.
Ried, H. A., **BAUB,** vol. 16–17, 1907, p. 63.
Saller, K., **ZFKL,** vol. 18, 1934.
Schicker, J., **MAGW,** vol. 35, 1905, pp. 54–55.
The most satisfactory group is the unpublished series of Mrs. R. S. Wallis of 62 male and 41 female Bavarian Reihengräber crania measured in the Anthropological Institute at Munich.

ancestors; but in a few of the smaller groups an approximation to the Keltic form may be suspected. In every local series, however, the head form remains constant, and there are very few brachycephals in any of them. The ancestors of the Hessians, if we may judge by a few examples, were apparently likewise dolichocephals [90] of the usual North German form.

The Alemanni may be studied by means of two principal series; a small one of twenty skeletons from Oberrotweil in Baden,[91] and a large one of over two-hundred from Augst,[92] in the canton of Aargau in Switzerland. The series from Baden, while retaining the usual Germanic cranial index, assumes in other respects the metrical character of the Keltic peoples whom the Alemanni succeeded, and who, as a matter of fact, possessed the same cranial index mean of 75 to 76. One must interpret this evidence from Baden as an indication that these Germanic invaders were to a large extent absorbed by previously settled Kelts, at least in the village which used this cemetery and its immediate neighborhood.

The Alemanni skulls from Switzerland are, as a group, high mesocephals with a mean of 78, and include a considerable number of brachycephalic crania. On the whole, the total series resembles that of the Keltic predecessors of the Alemanni, but the stature increased to a mean of 168 cm., and the cranial index of the entire group was gradually lowered. In the fifth century, 50 per cent of the Aargau Alemanni were brachycephalic, in the seventh century, 44 per cent, and in the eighth, 24 per cent. Coincidentally, the mean cranial index was reduced over this three hundred year span from 80.2 to 77.5. Thus the Germanic element, or perhaps a Germanic-Keltic blend, increased at the expense of the earlier population, and this increase was, as we shall see later, destined to become, in parts of Switzerland, permanent.

The Thuringians, who are known to us through a series from the Saale Valley in Germany, and through others from several sites in Bohemia,[93] practiced the unusual custom, for Germans, of deforming the head by annular constriction. Enough undeformed crania are left, however, for one to determine their racial type. The Thuringians were purely dolichocephalic. In none of these groups has a single round-headed skull been found. The skulls are, in fact, longer headed than the normal Anglo-Saxon and Hanoverian basic type and bear certain resemblances to the original Iron Age Danish group, and, at the same time, to the Hallstatt

[90] Virchow, R., **ZFE**, vol. 9, 1877, pp. 495–504.
[91] Fleury-Cuello, E., **ZFMA**, vol. 30, 1930, pp. 406–428.
[92] Schwerz, F., **AFA**, vol. 43, 1917, pp. 270–300.
[93] Holter, F., **JVST**, vol. 12, 1925, pp. 1–114.
Hellich, B., *Praehistorické Lebky v Čechach ze Sbírky Musea Království Ceskeho.*
Malý, J., **AnthPr**, vol. 13, 1935, pp. 37–53.
Niederle, L., **MAGW**, vol. 22, 1892, pp. 1–18.

crania of the same region in which they are found. One may state definitely they are not of Keltic type, and these people had apparently not mixed to any extent with the Boii who had preceded them and from whom Bohemia derived its name. Like the Boii, however, the Thuringians were not destined to remain long on Bohemian soil, for this fertile plain which had been subjected to constant farming since the beginning of the Danubian Neolithic was soon to be taken permanently by the Slavs in the early period of their great expansion.

The Germanic settlement of Austria, including the Tyrol, was a complicated process, involving the Alemanni, the Bajuvars, the Lombards, and the Goths. The Alemanni were the earliest, and the Bajuvars the most important. In the mountains, the Lombards settled the southern Tyrolese valleys, the Bajuvars those to the north. In the meanwhile, the Huns contributed a mongoloid element, diluted through mixture with the Gepidae. During the seventh century, the picture was further complicated by a temporary Slavic expansion which may have left human traces in certain of the Tyrolese valleys. Throughout all this turmoil, the Romanized Rhaetians still maintained their ethnic integrity in the remoter spots, as is witnessed by the survival of Ladino speech.

A study of the Austrian crania of the centuries of Germanic settlement, including for the most part those of Bajuvars, shows them to have been largely Nordic, of the usual northern type.[94] A small series of special interest is that of 26 Lombard crania from two sites: from Nikitsch in the Oberpullendoff district of Burgenland, and Vinzen, near Regensburg, in Lower Austria; both dating from the fifty year interval which the Lombards spent north of the mountains before their final burst into Italy in 568 A.D.[95] Eight skulls are those of the usual Germanic variety of Nordics, with some exceptionally tall- and large-skulled individuals, while five others ranging in cranial index from 77 to 93, show in their flat faces and broad nasal bones clear traces of mongoloid mixture. A single male, in the Nikitsch series, was strikingly different from the others; a short-statured Armenoid or Dinaric, with typical brachycephalic skull, occipital flattening, sloping forehead, and other Near Eastern features. He was obviously a stranger incorporated into the composite Lombard camp, either a local Dinaric or an Asiatic. In earlier times, the Romans had stationed both

[94] Geyer, E., **MAGW**, vol. 61, 1931, pp. 162–194.
Hell, M., **WPZ**, vol. 19, 1932, pp. 175–193.
Merlin, H., **MAGW**, vol. 16, 1886, pp. 1–7.
Müller, G., **MAGW**, vol. 66, 1936, pp. 345–355.
Seraczin, A., **MAGW**, vol. 54, 1929, pp. 323–332.
Vram, U., **RDAR**, vol. 9, 1903, pp. 151–159.
[95] Müller, G., *loc. cit.*

Syrians and Scotchmen in the Tullnerfeld as garrisons;[96] hence the ethnic heterogeneity in this region was chronic.

The culmination of the overland expansion of the Germans in the southwest was the conquest of Gaul by the Franks. Marching from the middle and upper Rhineland, they followed the river valleys across Belgium and into the valleys of the Seine and Marne, which became the seat of their political activities. When they arrived in this region, they were still pagan, which was an advantage, for under the leadership of Clovis they were able to embrace the currently popular brand of Christianity. This helped them to win favor with the Romans, and was an important factor in their success. The Gepidae and Vandals, who had become Christian much earlier, belonged to the schismatic Arian sect which was then in disfavor.

These German invaders brought into France and Belgium little which was new in the way of material culture, and the continuity of the older tradition shows clearly that a racial change in the total population, south of the Flemish plain where Frankish is still spoken, could not have been complete. During the four centuries of Frankish rule in France and in the hilly provinces of Belgium the language of the common people, which remained a form of Latin, prevailed over the speech of the conquerors, with the result that the national language reëmerged as a Romance tongue. This sequence of linguistic events stands in striking contrast to the situation in England, where Keltic, which had never been completely downed by Latin as in France, gave way rapidly and permanently before Germanic speech.

There are enough regional skeletal series of the Frankish period in France and Belgium to permit some study of their local characters. The skeletal remains from Boulogne [97] and other towns along the English channel are all long-headed and of an Anglo-Saxon racial type, which confirms the historical record that these regions were settled by seafaring Saxons rather than by Franks. The coastal distribution of Saxon place names in Normandy and eastern Brittany supports this identification. On the opposite frontier of France, at Collognes, near the western end of Lake Geneva,[98] the descendants of the Burgundians had become brachycephalic, and almost indistinguishable from their Neolithic predecessors who had lived at Vaureal, a few kilometers away.

Aside from these marginal and collateral groups, the Franks themselves did not differ greatly from place to place. The most extensive Belgian series is that from Cipley in Hainaut, that of France is Mrs. Wallis's series drawn from most of the Frankish territory in the northern part of

[96] Lebzelter, V., and Thalmann, G., **ZFRK**, vol. 1, 1935, pp. 274–288.
[97] Hamy, E. T., **Anth**, vol. 4, 1893, pp. 513–534; vol. 19, 1908, pp. 47–68.
[98] Manouvrier, M., **BSAP**, ser. 4, vol. 8, 1897, pp. 626–654.

the country.[99] (See Appendix I, col. 45.) These series show clearly that the Franks were a moderately variable group, but differing as a whole from the basic North German type from which they were presumably derived. Although individuals belonged to this type, the Franks as a whole resembled the Keltic peoples who had occupied Belgium and northern France before them. This resemblance included the common possession of a cranial index of about 76, and a cranial vault height of 132 mm. No particular difference can be found between the Merovingian Franks and the local Kelts in cranial dimensions or form, except for one important fact: instead of falling between the Kelts and the other Germans, in many metrical criteria the Franks slightly exceed the Kelts themselves. This is true of facial and cranial vault indices. The stature of the Franks, furthermore, is on a Gaulish level, with a mean of 166 cm. for males from Belgium, and indications that in France it was even lower.

The conclusion to be drawn from this comparison is that the Franks acquired their Keltic-like major physical form in the Rhineland, or the southwestern part of Germany in general, before the Saxons drove them to France and to the Low Countries. Here, whatever mixture took place between them and the previously installed Keltic population made little or no racial difference. This conclusion is supported by the evidence from Baden, that the Alemanni had likewise, from the beginning of their sojourn in southwestern Germany, succumbed to Keltic mixture. Except along the Channel coast, the Germanic invasions of France and southeastern Belgium furnished nothing novel to the ultimate racial composition of these countries. That of the Kelts, on the other hand, reënforced by these Merovingians, was of some importance.

The summary of our information concerning the racial origins and dispersion of the early Germanic peoples may be stated briefly and simply. At the beginning of the local Iron Age, a new people, bearing a Hallstatt type of culture, entered northwestern Germany and Scandinavia. These invaders were of the usual central European Nordic type associated in earlier centuries with the Illyrians. Through mixture with the local blend of Megalithic, Corded, and Borreby elements, these newcomers gave rise to a special sub-type of Nordic which was characterized by a larger vault and face, a heavier body build, and a skull form on the borderline between dolicho- and mesocephaly.

The Germanic tribes that wandered over Europe during the period of migrations belonged essentially to this new type. Exceptions were the Alemanni and Franks, who, in southwestern Germany, assumed a Keltic

[99] Houzé, E., **BSAB**, vol. 32, 1913, pp. cix–cxl, for 44 males and 35 females from Cipley. Mrs. Wallis's series, measured in the Musée Broca and the Musée d'Historie Naturelle, consists of 136 males and 66 females.

physical guise, which they spread to Belgium, France, and Switzerland, countries already familiar with the Kelts in person. Other exceptions were the coastal Norwegians, to whom for the first time civilization was now brought in significant quantity. In the shelter of their chilly fjords the new Nordics blended with the hunters and fishermen left over from the age of ice, who, through this new genetic vehicle, were assured permanent survival.

(7) THE SLAVS

The Slavs, together with their close neighbors and linguistic relatives the Balts, stepped relatively late into the theater of European history. Speaking an archaic form of the Satem branch of Indo-European, they almost miraculously succeeded in maintaining their linguistic integrity through the period of obscurity which preceded their time of dispersion, despite the widespread activities of the Kelts, the Scythians, and the Germans. Slavic is close in many respects to the original form of Indo-Iranian, a fact which cannot fail to have cultural and geographical significance.

It is not yet possible to associate the early, united Slavs with any specific archaeological horizon more remote in time than the comparatively recent Burgwall moated villages of the early centuries of the present era. Although all Slavic scholars are not in agreement as to the location of their original home, the opinion of Niederle, the dean of Slavic prehistorians, bears the greatest weight.[100] He would place it in the densely forested basin of the Pripiet River, in northwestern Ukraine and southeastern Poland. This region is bounded on the west by the Vistula, on the south by the upper course of the Dniester, and on the east by the great forests of the former Tchernigov and Poltava Governments. In other words, the Slavic ancestors escaped loss of ethnic identity at the hands of the Scythians and the Goths through their occupancy of a relatively wooded and swampy country.

Their neighbors to the west were Germans and Kelts, who lived on the other side of the Vistula; the Balts occupied the side facing the sea after which they have been collectively named, while the undivided Finns dwelt along the forested stream banks near the sources of the Volga, Oka, and Don. The early Iranians, near linguistic relatives of the Slavs, had occupied the plains to the south and east, while the Thracians bordered the Slavs on the far side of the Carpathian mountain chain.

Like the earliest Iranians and unlike the Scythians, the Slavs were sim-

[100] Niederle, L., **ACIA**, 2me Session, Prague, 1924, pp. 241–247. For source material see his exhaustive series of volumes on the history of the Slavs, *Slovanské Starožitnosti.* For a recent review of Slavic problems, Sonnabend, H., *L'Espansione degli Slavi.*

ple farmers and herdsmen. Living in swamps and forests, they had adapted themselves to difficult climatic conditions. For some reason still imperfectly understood by the students of population dynamics, they grew increasingly numerous in the period between the second and fifth centuries A.D., and began spilling outward in all possible directions.

The westward Slavic expansion over much of what is now Germany was temporary, for the Germanic peoples themselves soon went through a period of eastward expansion during which they Germanized many of the new Slavic groups, either by force or by peaceful assimilation. A few islands of Slavic speech and culture survived this movement, notably that of the Wends in the Saxon Spreewald. The movement of the South Slavs took them to the Dinaric mountain chain behind Lower Austria, which certain bands crossed to the peninsula of Istria at the head of the Adriatic, and into northern Italy itself. The main body moved southeastward along the Adriatic coast, following the Dinaric mountain chain to Montenegro, and to the Gorë region of northeastern Albania. A southern Slavic nucleus was formed in the kingdom of Old Serbia, centered around Prizren and Skoplje. From this nucleus they expanded into the plain of Kossovo which, however, they were soon to lose in great part to Turks and Albanians. The Serbs, the most important single people involved in this southern expansion, still speak a language closely allied to that of the Wends in Germany.

The movements of the Slavs to the eastward constituted an intensive reoccupation of the rich, black earth belt by peasants, for, since Late Neolithic times, this fertile strip of treeless lowland had been the favorite pasture and campaigning ground of tribes and nations of warlike nomads, inimical to the full utilization of the ground for tillage. From this black earth region the eastern Slavs followed the watercourses of central Russia northward into the forest country then inhabited by Finns. This upstream movement dislodged some of the Finnish tribes, and brought about their historic migration to the Baltic. Many of the Finns, however, stayed behind and became Slavicized, mixing with their conquerors. Still others remained aloof in small ethnic islands, which even today retain their Finnic speech.

The eastward expansion of the Slavs did not stop with the Urals, but gradually continued, after interruptions by Turks and Mongols, into Siberia, until finally, in the seventeenth century, its outposts reached the Pacific. The Slavs are still growing more numerous and still moving eastward. Their period of efflorescence, the latest of the Indo-European expansions, has not yet come to an end.

Since the Slavs continued the practice of cremation well into the early centuries of the present millennium, skeletons from the period of unity are

non-existent, and those from the early centuries of expansion are not abundant. However, in this instance, literary evidence antedates the osteological, for numerous descriptions of the early Slavs, assiduously collected by Niederle, occur in the writings of Byzantines, Arabs, and Persians.[101] With only one exception, these make the Slavs tall, spare, and blond or ruddy. They were often confused with Germans, and this fact strengthens the likelihood that they were predominantly of light pigmentation. Only one voice was raised to the contrary, that of a Jew named Ibrahim ben Yakub, who, having crossed Bohemia in 965 A.D., remarked that the Bohemians were surprisingly dark haired. Niederle interprets this solitary dissention as evidence that Ibrahim, accustomed to or expecting blond Slavs, was struck by a local enclave which differed from the Slavs as a whole. In view of the preponderance of contemporary opinion to the contrary, ben Yakub's dissention must not be given too much weight.[102]

If the evidence of literary sources makes the early Slavs Nordic in stature and pigmentation, that of osteology makes them the same in the metrical and morphological sense. In brief, all of the earliest Slavic skeletal material, dating mostly from the eighth to the eleventh centuries, falls, by groups if not as individuals, into one or more of the Nordic categories already found to be characteristic of Iron Age Indo-European-speaking peoples.

That from Poland, the eastern half of which was included in the home of the Slavic peoples before their period of dispersion, is not very abundant. Altogether less than 40 male crania may be assembled, and few of these have complete measurements.[103] (See Appendix I, col. 46.) These skulls are all predominantly dolichocephalic; the mean cranial index is 73, and not a single round-headed example is included. Among these Polish skulls are some notably long and large specimens with long, narrow faces. The noses of the group, as a whole, are fully leptorrhine. On the whole, the ancestral Slavs of Poland were Nordics, within the range of the Indo-European group; these skulls lean to the longer- and larger-headed Corded extreme, and resemble in many respects, the Hannover series, and by extension, the Anglo-Saxons.

Numerous remains of the Slavic expansion into Germany show clearly the physical types of the particular invaders concerned in this quarter. The most important series is that studied by Asmus, who collected the

[101] Niederle, L., **AnthPr**, vol. 7, 1929, pp. 62–64; also *Slovanské Starožitnosti*, vol. 1, 1925, pp. 98 ff.

[102] The passage in question has been translated and retranslated through a number of languages. I have been unable to find the Arabic original.

[103] Kopernicki, I., **ZWAK**, part i, 1883.
Majewski, E., **Swiatowit**, vol. 9, 1911, pp. 88–94.
Rutkowski, L., **Swiatowit**, vol. 7, 1907, pp. 3–21, 22–38.

skulls of the ancient Wends of Mecklenburg.[104] (See Appendix I, col. 47.) These form a reasonably homogeneous group of high dolichocephals and low mesocephals, with a moderate vault height, a low sloping forehead, long narrow faces, leptorrhine or mesorrhine noses, high orbits, and a strongly built jaw. These Old Wends, rounder headed than the Poles, fall very close metrically to the Kelts and to the Scythians. In intermediate parts of Germany, particularly in western Prussia and Pomerania, the Old Slavic skulls are higher vaulted, and closer in this respect to the Polish sub-type.[105]

Those in Bohemia are for the most part the same as the Wend crania in Germany, except for one series of Matiegka (see Appendix I, col. 48); in this, the vaults are extremely high, nearly reaching early Corded dimensions. This is true to a minor extent of a small group from Slovakia and of individual skulls.[106] Thus, in Bohemia, the Slavs included three sub-types, with Hallstatt, Polish, and Keltic analogies.

The Slavs who invaded Styria between the seventh to ninth centuries are basically the same as those in Germany, and fall very close to an older Keltic mean.[107] They formed, without question, a mixed group and included in their number a minority of round-headed forms. Some of the Slavic crania from Styria, recalling the Polish prototype, are extremely large and powerful. We have, unfortunately, no data with which to trace the further progress of the southern Slavs into the Dinaric mountain stronghold, and thence into Old Serbia and the Kossovo plain. We may, however, study a third Slavic movement, that which penetrated Russia.[108]

The skulls of these invaders belong to a generalized Nordic form, with a cranial index of 75 to 76, and an intermediate vault height. The Ukrainian skulls from the eighth to the ninth centuries A.D. do not greatly diverge from this general standard, but the early Slavic crania from the Moscow region in Russia, dated from the eleventh to twelfth centuries A.D., are, in fact, almost purely dolichocephalic, with a mean cranial index of 73.5.

[104] Asmus, R., **AFA,** vol. 27, 1902, pp. 1–36.
[105] Müller, W., **JVST,** vol. 5, 1906, pp. 60–77.
Reuss, K., **JVST,** vol. 6, 1907, pp. 93–112.
Schumann, H., **ZFE,** vol. 23, 1891, pp. 589–592, 704–708; vol. 26, 1894, pp. 330–336; vol. 30, 1898, pp. 93–100.
Virchow, R., **ZFE,** vol. 23, 1891, pp. 349–350; vol. 24, 1892, pp. 550–555.
[106] Cervinka, J. L., and Matiegka, J., **AnthPr,** vol. 3, 1925, pp. 97–108.
Jelinek, B., **MAGW,** vol. 20, 1890, pp. 136–147.
Matiegka, J., **AFA,** vol. 25, 1896, pp. 150–154.
Szombathy, J., **MAGW,** vol. 52, 1922, p. 20.
Wankel, H., **MAGW,** vol. 12, 1882, pp. 123–128.
[107] Toldt, C., **MAGW,** vol. 42, 1912, pp. 247–280.
[108] Debetz, G., **AntrM,** vol. 4, 1930, pp. 93–105.
Derviz, D., **RAJ,** vol. 12, 1923, pp. 24–38.
Stefko, W. H., and Schugaiew, W. S., **AFA,** vol. 50, 1932, pp. 44–55.

On the whole, the Slavic racial type, as exemplified by skeletal series from Poland, Germany, Bohemia, Austria, and Russia, was reasonably uniform. In view of its geographical location, the Polish group probably represents most nearly the original form, while those who expanded southward and westward absorbed local Keltic and other Indo-European-speaking populations. The Slavs, like all the other Indo-European-speaking peoples whom we have been able to trace, were originally Nordic, and there is no suggestion in their early remains, in the regions studied, of the numerically predominant brachycephalic racial increments which today are considered typically Slavic. However, the Slavs who migrated to southern Hungary, like the Germanic Gepidae before them, mixed with a local short-statured, broad-faced, and broad-nosed brachycephalic people, who, antedating the historic arrival of the Magyars, were descended from the central Asiatic Avars.[109]

Most of the Slavs retained their original dolichocephalic cranial form until at the earliest the thirteenth, and the latest the fifteenth, century. At that time, those who inhabited Russia and central Europe grew progressively brachycephalic, at a rapid but consistent rate. Well-documented series from Bohemia and the Moscow government show how this change progressed from century to century, so that normal means of 73 to 75 rose as high as 83 by the nineteenth. Few Slavs were spared this change, which was parallel to that which affected the southern Germans and other peoples of central and eastern Europe. Although it took place in the full light of late mediaeval and modern history, no one fully satisfactory explanation has yet been offered.

(8) CONCLUSIONS

It is unnecessary to dwell long upon the conclusions reached in this chapter. They may be stated very simply and briefly.

The predominant peoples of the Iron Age in Europe as well as in central Asia, the West-Asiatic highlands, and India were Indo-European speakers. For some mysterious reason as yet incompletely understood, various branches of this linguistic stock underwent periods of rapid expansion during which the human beings who spread these languages migrated in many directions and disseminated their physical type as well as their speech among other peoples. There had, however, been comparable expansions before this. The conquest of the cold brought human beings into parts of the world where only Neanderthal men and lower animals had lived, under equivalent climatic conditions, before them. In the absence of competition and in the abundance of game, they were able to multiply until they were sufficiently numerous to satisfy the requirements

[109] Sziráky, S., and Huszár, G., **MAGW**, vol. 63, 1933, pp. 229–232.

of their environment. The retreat of the ice and the shifting of belts of climate had precipitated other movements which may have taken the form of expansions, and the discovery of agriculture and animal husbandry, of course, gave rise to that expansion which Childe calls the Neolithic Revolution.

The Danubian invasion of central Europe from the east may be considered as an isolated wing of this movement, that of the swineherds who entered Europe from the southeast, another. In the same way, we may consider the migration of the megalith-builders by sea; the wanderings of the Bronze Age brachycephals, by land and water; and the rapid movements of the Corded people across the plains of eastern and central Europe, as successive and at the same time parallel expansions. Thus, this business of expansions was not initiated by the Indo-European speakers. If we knew the languages of the peoples who preceded them, we might in each case find parallel linguistic as well as racial circumstances.

The principal point to this chapter is that the Indo-European languages were, at one time, associated with a single, if composite, racial type, and that that racial type was an ancestral Nordic. We have determined this through a study of the skeletal remains of peoples known to have spoken these languages at or near the time of their initial dispersion from their several centers. The sub-variety of Nordic concerned in each case varied, and the variations usually depended upon mixture with other peoples, amalgamated during the process of differentiation and expansion. Nevertheless, the various brands of Nordic so produced were still very much alike.

Another result of the investigation pursued in this chapter is the discovery that the mysterious Urnfields people, who began, toward the end of the Bronze Age, to destroy their skeletal evidence and did not cease this practice until well into the Iron Age, were probably Nordics. Hence the smoke veil has been lifted and we may be reasonably sure of what happened. Under this screen, the Nordic-like Early and Middle Bronze Age peoples of central and eastern Europe became Iron Age Indo-Europeans; no important change of race, then, took place in the focus of Urnfields development, that is, in eastern Germany, Poland, and the Ukraine. It is likely that no important change of language occurred there either.

Since, as we have seen, the Early Bronze Age central Europeans were racially a Corded-Danubian blend, a concordance of racial facts with the most recent linguistic deductions would make the following proposition likely:

The Danubians who settled the fertile plains and valleys of eastern and central Europe already spoke basic Indo-European; the Finno-Ugrian-Caucasic blend which produced this linguistic entity took place before their

migration westward. The introduction of Altaic words, particularly those concerned with the care of the horse, were infused into the previous Indo-European linguistic blend at the time of strongest Corded influence in central Europe, which produced the Aunjetitz culture.

This reconstruction helps to support Nehring's conclusion that the Danubians were the first speakers of Indo-European languages on European soil, and that Indo-European may be divided into two chronological levels without reference to the Centum-Satem division. If the original agricultural and cattle-raising complex was connected with the Danubians, the horse element with its Altaic linguistic connections would belong to the Corded. By this argument, we may construct a reasonably complete concurrence between the three disciplines: physical anthropology, archaeology, and linguistics.

At this point, a word of caution is needed. We must not carry the associations suggested in this chapter too far, and above all we must not form the opinion that the terms Nordic and Indo-European are inseparable. Indo-European speakers, from the moment of their initial dispersion, began mixing with other peoples, and the specific association between language and race found in this instance has by now been largely dissipated. Furthermore, the Nordic race as we have studied it in Europe was formed from the union of two or more widely distributed and essentially related racial types. It is quite possible and even likely that similar combinations of the same elements took place elsewhere, and that other Nordics may have arisen without reference to Indo-European speech. Furthermore, we must remember that, although most Iron Age Nordic groups of which we have literary descriptions were wholly or partially blond, we cannot be sure that all prehistoric skeletal material which seems Nordic in an osteological sense was associated with blond soft parts; we must also remember that the "Nordics" in the living sense have no monopoly on blondism.

Chapter VII

THE IRON AGE, PART II

Speakers of Uralic and Altaic

(1) THE FINNO-UGRIANS

In the preceding chapter it has been shown that the Indo-European languages were probably formed somewhere on the plain of southern Russia or western Turkestan, by a blending of languages spoken by peoples in a Neolithic or early Copper Age stage of culture. One of the two linguistic elements in this blend has been positively identified with Finno-Ugrian, which at the same time forms one of the two lateral divisions of the Ural Altaic stock, the fundamental unity of which is under question.[1]

The blending of Finno-Ugrian with the B element which produced Indo-European languages took place at some time no earlier than the last few centuries of the fourth millennium B.C., well after the acquisition of agriculture and animal husbandry by western Asiatic peoples, and before the adoption of a complete Bronze Age technology by the inhabitants of the plains north of the Caucasus and the Iranian plateau. The Finnish speakers, who contributed so largely to Indo-European speech at that time, must have been residents of the plains at the time of their meeting with the bringers of Caucasic speech with which their own language was united. At the same time, they must inevitably have contributed to the formation of the racial blend with which the resulting Indo-European languages were early identified.

The historic Finno-Ugrians, of whom frequent mention has been made in the past, with little elucidation, include in the first branch all of the Finnish-speaking tribes of central and northern Russia, the Esthonians, and the Baltic Finns, as well as the Lapps, who speak an archaic Finnish dialect; in the second, the ancestors of the Magyars, the Bolgars, and the Siberian Ostiaks and Voguls.[2] At the time of their first historical mention, in the classical period, they seem to have been united in central and northern Russia. The Finns were centered about the middle course of the Volga,

[1] Professor G. J. Ramstedt of Helsingfors University, an eminent student of Altaic languages, has come to the conclusion that the Uralic and Altaic groups of languages are not, as was previously thought, demonstrably related, but form two entirely separate linguistic stocks. He is supported in this view by Professor Szinnyei of Budapest.—Private Communication.

[2] See Chapter IX, section 8, for a detailed listing of the living and extinct peoples known to have spoken Finno-Ugrian languages.

and west to the country occupied by the Balts and the Slavs; the Ugri between the Volga and the Urals. In the sense that they occupied one unified territory from which they later spread, they emulated the behavior of their Indo-European-speaking neighbors. Movement to the south was inhibited, in historic times, by the presence of the Scythians and Sarmatians; before the rise of these horse-nomads, however, they must at some time have been in contact with Caucasic-speaking peoples, who may have included the mysterious pre-Scyths, the Cimmerians, the remnants of whose speech have been likened to modern Cherkess.[3]

A Finnish expansion took place in historic time, and during the Christian era. It consisted of the following movements: the migration of the ancestors of the Baltic Finns to the northwest, largely as a result of Slavic and Letto-Lithuanian pressure—this took place at the same time as the Slavic penetration of Russia; the movement of the Bolgars to Bulgaria, during the seventh century, and of the Magyars to Hungary, under Turkish leadership, during the ninth; the migration of the Ostiaks and Voguls across the Urals to the Obi drainage, during the thirteenth.

Before the time of known Finnish expansion, the Scythian barrier inhibited the use of agriculture as a primary means of subsistence among the Finnish tribes located to the north of the nomads. Many of the Finns, in fact, lived principally by hunting and fishing along the forested streams which formed the headwaters of the Volga, Don, and Dniester. But it is unlikely that the Finns in pre-Scythian times had been ignorant of agriculture; those who lived in arable country farmed at least by the time of Herodotus.

The evidence for the racial composition of the early Finns is scanty, but incapable of misinterpretation. One small series of ten skulls dating from about the sixth century B.C., contemporaneous with the Early Scythian period, has been identified with the ancestors of the Volga Finns at the time of their unity.[4] (See Appendix I, col. 49.) These come from the cemeteries of Polianki and Maklacheievka, from the former Viatka government in Permian Finn country just south of the present Komi or Zyryenian Republic. The graves belonged to the so-called Anan'ino cultural horizon. This Anan'ino culture [5] was formed from a combination of influences from Siberia, the Caucasus, Scythia, and Scandinavia. It did not end suddenly, but passed by a gradual process of evolution into the civilization of the historic Volga Finns. Therefore, we may consider these skulls, few as they are, to represent the ancestors of the Finns before the beginning of their historic expansion.

[3] Baschmakoff, A., **ZFRK,** vol. 4, 1936, pp. 194–199.
[4] Debetz, G., **ESA,** vol. 6, 1931, pp. 96–99.
[5] Tallgren, A. M., **Real,** vol. 1, pp. 164–165.

This small group of seven male and three female crania is not completely homogeneous, but it is nearly so. All of the skulls are European in racial type. The faces are a little broader than in most Mediterranean groups, but not to an exceptional degree. The noses, with the exception of one extremely leptorrhine male, are mesorrhine or chamaerrhine; but so are those of many early Danubians. The cranial form is mesocephalic or dolichocephalic, with one male reaching the figure of 83; the vault is moderately high; the forehead usually straight, the browridges moderate.

There is nothing new about these crania, and nothing specifically mongoloid. They closely resemble another small series of eight male skulls from the cemetery of Polom in the same district as the Anan'ino cemeteries[6] (see Appendix I, col. 50), dating from the ninth century A.D., and known to have been those of Finns of the Permian sub-family. In view of the small numbers, no difference can be found which would be statistically valid. A third group from the Lower Volga, representing the Mordvins of the fourteenth century, is similar to the Anan'ino and Permian crania, except that it is extremely long headed, with low indices, centered about the range from 71 to 73.

When we make a metrical comparison between the first two groups of Finnish skulls and all European series previously studied, we find that they fit into the ranks of Iron Age Indo-European speakers without difficulty. On the whole, they resemble most nearly the larger-sized members of the intermediate group; they also resemble the Scythian crania to a considerable extent, and even more the Minussinsk skulls. They are slightly smaller than the Germanic type, but equal to it in vault height and face breadth. In nose form and cranial height, they resemble the Neolithic Danubians.

News of the racial position of these early Finnish skulls will come as a surprise to scholars who see in the Finns a group of mongoloid immigrants from Asia. But that they were essentially if not wholly European is, despite the paucity of Debetz's material, incontestable. Nor can one derive these Finns from forest-dwellers of Mesolithic tradition, except perhaps as a minor influence. Furthermore, in the early Anan'ino series, recognizable Corded peculiarities are to be found in but one male skull out of seven. The Finno-Ugrians, therefore, may be tentatively considered to have been, in the period before they expanded into their historic seats, Europeans of mixed origin, basically Danubian in type, with some brachycephalic element and an extremely long-headed variation as well; the latter is already familiar to us in the form of the Corded type; the former is not clearly definable, but is European. Its only discernible difference from the others in the same series is in a greater breadth of the skull. This broad-headed

[6] Debetz, *loc. cit.*

element is completely lacking in the late lower Volga group, of which we have only the cranial indices.

Debetz's discovery that the Finno-Ugrian speakers were originally purely European in race, and furthermore, not local Palaeolithic or Mesolithic survivors, is in perfect accord with the present state of linguistic knowledge, which makes their form of speech one of two equally weighted elements in the basic Indo-European. They not only were, but on logical grounds must have been, in the larger sense, Mediterraneans.

On equally logical grounds, this discovery does not invalidate the hypothesis that the descendants of Mesolithic hunters and fishers persisted until modern times in the forests of the far north, nor that some such survivors may not have been absorbed by those tribes of Finns which migrated even beyond the Permian country to the chilly drainage of the Arctic Ocean. This theory is very hard to test, however, for if we review the early racial history of the northern forest belt,[7] we find very little skeletal data with which to work. What material there is comes almost entirely from Latvia, Esthonia, and the Ladoga Lake country, all north and west of the historic Finnic center. It includes skulls of Corded type, both with and without mixture, and a number of ill-defined crania which do not fit into the usual European picture. Many of these latter are brachycephalic, some are perhaps, but not certainly, incipiently or partially mongoloid.

Unfortunately, the manner in which these skulls have been published does not permit a lucid review of their racial position. Similar ones appeared sporadically in Late Neolithic and Bronze Age series in Poland and on the plains of southern Russia, apparently as intrusions from the north, but not in sufficient numbers to alter the prevailing character of the population south of the forest from which they, as the osseous headpieces of stray woodsmen, had wandered.

Until almost three centuries after the birth of Christ, therefore, Europe, except possibly along the very Arctic rim, had not witnessed the invasion of any mongoloid people. Western Asia, from the Bosporus to the Indus, and the plains immediately east of the Caspian as well, were equally ignorant of them. But with the arrival of the Huns this gap was soon filled.

(2) THE TURKS AND MONGOLS

In order to discuss the movements of Asiatic peoples into Europe from the first inroad of the Huns to the conquests of the Osmanli Turks in the sixteenth century, it will be necessary to review briefly the events in central and eastern Asia which preceded and precipitated these incursions.

[7] See pages 125–126.

From the time that the Irano-Aryan ancestors had arrived in Russian Turkestan in anticipation of their descent into the hills of northwestern India, much of this grassy plain had been the home of those Iranians who remained behind while their kinsmen climbed the mountains which would take them into India and the Irano-Afghan plateau. These Iranians apparently developed, or borrowed, a high degree of adaptation to their steppe environment, and especially through the perfection of pastoral nomadism with the horse as chief instrument of mobility. They expanded through the passes to the eastward, which took them to Kashgaria, and there came in contact with the Chinese Empire. On the other side, they expanded westward into Europe, where we have already studied them in the form of Scythians and Sarmatians.

To the northwest of the vast Iranian domain, in Mongolia, a number of semi-agricultural, semi-pastoral tribes, possessing the sheep, probably also cattle, and perhaps wagons, but apparently not the horse, came in early times to the attention of the Chinese historians. By 800 B.C. we hear of a people called the Hiung-Nu, who gradually grew in importance until they came to dominate all of Mongolia.[8] At a fairly late date, set by McGovern between 541 and 300 B.C., the Hiung-Nu presumably obtained horses, and learned to ride them. They seem to have acquired these animals from the Iranians or from Turkish-speaking peoples, along with the whole complex of horse nomadism. Chinese accounts of the Hiung-Nu later than the third century B.C. refer to them as typical plainsmen, strikingly similar in many cultural respects to the Scythians.

The six centuries, more or less, from 400 B.C. to 200 A.D., formed the period of greatness of the Hiung-Nu in Mongolia, during which they constantly harried China, and took possession of Chinese Turkestan. Despite their conquest, however, Iranian languages, and the mysterious Tokharian B, persisted in the towns until 800 A.D. or later. At length the Chinese took measures to rid themselves of this nuisance, and succeeded in defeating the Hiung-Nu so completely that they abandoned their territory and disappeared to the westward.

The last mention of the Hiung-Nu in Chinese sources is about 170 A.D. and, exactly two hundred years later, the Huns appeared on the banks of the Don in Russia. McGovern has presented a convincing argument to prove that the two were the same people; that their passage across Asia took them across a space sterile of historians, between the spheres of Chinese and of Byzantine chroniclers. Only one glow of light appears in this interim; in 290 A.D. Tigranes the Great of Armenia hired some such people as mercenaries.

[8] McGovern, W. M., *Early Empires of Central Asia.* I am indebted to Dr. McGovern for permission to make use of his book before publication.

The history of the Huns in Europe does not require elaborate treatment. Having defeated the Ostrogoths and sent them and their kinsmen scurrying westward, the Huns moved to the present Hungary, which they made their headquarters. From here they sent expeditions to Rome, to Germany, and to France, where Attila was defeated in the battle of the Catalonian fields in 451 A.D. After his death two years later, the Huns retired to eastern Europe, and many of them united with their relatives the Bolgars, who had settled between the Ugrian and Finnic tribes of the middle Volga and Kama rivers, where, under Bolgar leadership, a great state arose, which flowered between the eighth and fourteenth centuries.

In the meantime, the Huns in central Asia raided Mesopotamia, Persia, Afghanistan, and India; presumably the Turkish penetration of central Siberia dates likewise from the period between 200 and 400 A.D. This span of two centuries marks the beginning of the great expansion of Turkish-speaking peoples, for the Huns, and their allies and relatives, must have spoken various forms of speech related to Turkish, many of which are now extinct.

When we view the Hunnish inroad into Europe in the light of the total context of Old World history, it ceases to be a strange inruption of hideous and invincible barbarians darting out of nowhere, as it at first appeared to the Byzantines and Romans. The Huns were a people who had been exposed to a high civilization, that of China; they were cultured if illiterate, and in every sense the match of the frightened adversaries whom they met in Europe. When we examine the details of these invasions, we see that it was not one simple inroad, but a series of them in which a perplexing confusion of names is involved. Chief of the newcomers, after the Huns, were the Avars, who arrived in the sixth century. The Huns considered these their kinsmen and equals, and later amalgamated with them after the Avars had, in the eighth century, been defeated by Charlemagne and had retreated, some to Hungary and others to the Don country.

From the fall of the Huns until the rise of the Mongols some thousand years later, the history of central Asia is simply a repetition of the same theme; some obscure sub-tribe would become important, win leadership over the others, and head new invasions of increasing complexity. The history of southern Russia became extremely complicated, for the steppes of the Don country served as a terminal point for all but the most serious of these movements.

After the Avars came the Turks, called Tü-Küe, hereditary iron-workers, who had been an old clan of the Hiung-Nu. They defeated the Avars in 546 A.D., and settled about the Caspian Sea; from here they conducted their raids and expanded, and gave their name to the whole linguistic

sub-stock of Altaic which all of them, Huns included, seem to have spoken. It is probable that their speech superseded many older allied forms.

In the guise of Petchenegs and Kumans, in the tenth and eleventh centuries new waves of Turks moved across the southern Russian steppes as far as the Danube. As Seljuks, the Turks took charge of Asia Minor and fought the Crusaders; as Osmanlis, they conquered the Seljuks, withstood the Mongol advance, captured Constantinople, and swarmed over the Balkans and up to Vienna. But meanwhile, in the thirteenth century, other Turks under Mongol leaders, now for the first time called Tatars, had covered southeastern Europe ahead of the Osmanlis; and, in the fourteenth, hordes of true Mongols had followed, leaving permanent settlements in the Caucasus, the Kalmuck Steppe, and the Crimea.

In the fifteen hundreds, the tide commenced to turn in eastern Europe; the Muscovites grew powerful, and the Asiatic invaders began to draw eastward as the steppes were peopled with Slavs. Under the rule of the Turks and Mongols, the older population had not entirely disappeared; colonies of Alans persisted until the thirteenth century, and Russian colonies lived under the protection of the Turkish Khazars. In the same fashion, the Turks and Mongols did not disappear with the Slavic advance, and their colonies in the midst of Slavic territory are still numerous.

There is an abundance of documents dealing with the invasion of Europe by the Huns and by their relatives the Avars. These inroads took place shortly after the expansion of the Germanic peoples to the east, and formed a primary reason for the failure of the Goths and Vandals to found a permanent home in the former Scythian country. They took place, also, before the major expansion of the Slavs, who moved eastward in the interim between the invasion of central Europe by the Huns and the wholesale westward migration of the Magyar ancestors under Árpád.

That the Huns came in great numbers cannot be questioned, and that they introduced a completely alien racial type onto European soil is vividly attested by the accounts of numerous contemporary historians, among whom may be mentioned Jordanes, Sidonus, Appolinaris, and Priscus. These authors unanimously describe the Huns as being short, broad shouldered, thick-set, swarthy, flat-nosed, slit-eyed, nearly beardless, and bandy-legged. The Avars are described by some authors as being identical with the Huns, but by others as being less horrible of aspect. According to that Byzantine wit, Jordanes, the Avars defeated the Iranian-speaking Alans, who were the descendants of the Sarmatians, by frightening them with their faces and not by valor.

The careful studies of Bartucz, on whose work this following part is almost entirely based, has disclosed, in unquestioned manner, the exact

racial composition of these invaders.[9] (See Appendix I, col. 51.) Many of the Hunnish and Avar cemeteries are very extensive, containing, in all, thousands of skulls. In many of these cemeteries, particularly in that of Mosonszentjános, purely mongoloid skeletons have been found, unaccompanied by European followers or European mixture.

Bartucz finds two clearly differentiated mongoloid types in these cemeteries. The first, which he designates as type A, is dolicho- to mesocephalic with a mean index of 75.5 for the males and 77.0 for the females. These skulls are of great length and considerable size. The forehead is very narrow, the temples sharply curved, and the zygomatic arches laterally bowed. The occiput is narrow and conical at the end. From the side profile, the forehead appears exceptionally low and slanting. The vertex falls well back of bregma, and the profile is curved through the extent of its length. In the occipital region the line of neck muscle attachment forms a powerful torus.

The vault of this type is lower than that found in any European group. It is, in fact, near the low point for mankind, with a range in height from 120 to 130 mm. The browridges, accentuated by the extreme slope of the forehead, are heavy, but the glabella region is flat, the orbits are rounded, and with the lower border often projecting farther forward than the upper. The nasal bones are long, narrow, and flat; so that the nasal skeleton sometimes fails to project in front of the malars. The lower borders of the nasal opening are smoothly rounded. The malars are extremely large and prominent, the canine fossa completely lacking, and the maxillary sinus, which overlies it, is so blown out that the surface of the bone is at this point often raised. The dental arch of the palate is U-shaped. The mandible is heavy, but the chin, however, but slightly developed. The whole sub-nasal portion of the face is enormous. The stature of this type, calculated from the long bones, is 164.4 cm. for the males, 153.1 cm. for the females.

Type B is also purely mongoloid, but it is brachycephalic, with a mean index of 83 for both sexes. The forehead is also low, but much broader and more sharply curved, the occiput is rounded and broad, and the skull as a whole is globular, although the vault is still low. The face is broad and low, the orbits are lower, the nose less leptorrhine, the malars and zygomata less pronouncedly mongoloid, than in the case of type A. The nasal bones are shorter, the palate broader and rounder, the chin more prominent. This type is characterized by shorter stature; 160.9 cm. for the males, and 152.8 cm. for the females.

[9] Bartucz, L., **ZFRK**, vol. 1, 1935, pp. 225–240; **Skythika**, vol. 2, 1929, pp. 83–96; vol. 4, 1931, pp. 75–90; **ESA**, vol. 5, 1930, pp. 66–73.
Krecsmarik, E., **Dolgozatok**, vol. 3, 1927, pp. 160–166.
Lebzelter, V., **MAGW**, vol. 65, 1935, pp. 44–46.

Thanks to the industrious researches of the modern Russian school of physical anthropology, it is not difficult to discover the Asiatic relationships of these two types. Type A is found today among the living Tungus,[10] and it has likewise a long history in Siberia, for it is found among many Siberian peoples, including Palaeasiatics, and it is characteristic of many of the Neolithic skulls excavated in the neighborhood of Lake Baikal.[11] Type B belongs to the Mongol-speaking peoples, and is found in especial purity among the Buryats, who represent, culturally and probably racially, the Mongols before the time of their expansion. Modern Buryat skulls are among the largest in capacity known.

In most Hunnish and Avar cemeteries, type B is more in evidence than type A. Type A, however, predominates in the cemeteries which are known to have been used by the Huns, type B in those which belong to Avars. The Avar cemeteries contain also, in many cases, intermediate types which show that these people had begun to mix with members of the white stock, either in central Asia, in Europe, or both, and other cemeteries in which the white element is in the majority. The leading classes of the Huns and Avars, however, appear to have kept themselves apart, and to have preserved their mongoloid racial types pure throughout the centuries of their political domination. In the graves which are most richly furnished, and which show that the occupants were men of power and consequence, the mongoloid types are unaltered. The two graves of known Avar heroes contain skeletons belonging purely to type B.

Bartucz's identification of type A predominantly with the Huns, and B with the Avars, seems valid. That the two intermarried freely is shown by the fact that in single graves containing a man and wife, the two are often of opposite types. In such cases of differential mating, there is no linkage between sex and type, indicating that A and B were socially equal. It is very likely that the initial amalgamation of these two types took place in Mongolia, and not in Europe. Also, the presence of numerous intermediate forms attests this freedom of intercourse. Individual Hunnish skulls found as far afield as Lower Austria and France may be easily identified with the crania from Hungary, and belong in known cases to type B.[12]

A further light upon the physical characteristics of the Huns is shown by a study of Hunnish head hair, from graves of this period. A sample of it is very fine, straight, and jet black.[13] In color and in form, this hair was classically mongoloid, but this fineness casts some doubt upon the generalization that all mongoloid hair must be coarse, especially since it has

[10] Roguinski, A., **RAJ**, vol. 23, 1934, pp. 105–126.
[11] Debetz, G., **RAJ**, vol. 19, 1930, pp. 7–50.
[12] Lebzelter, V., **MAGW**, vol. 65, 1935, pp. 44–46.
Zaborowski, S., **RA**, vol. 24, 1914, pp. 318–320.
[13] Greguss, P., **Dolgozatok**, vol. 7, 1927, p. 232.

been shown that American Indian hair is very variable in this respect.

The incontrovertible evidence of the Hungarian graves completely dispels the theory that the Huns may have been largely European in racial type. If the Hiung-Nu were ancestors of the Huns, then the early inhabitants of Mongolia were definitely mongoloid, and belonged to the two important racial elements present there today, the Tungus and the Mongol proper. This throws the prehistory of central Asia into a clear and logical light. It is exactly what one would expect.

But it is necessary to discover what was the nature of the European racial element amalgamated by the Avars. This may be accomplished by studying some of the least mongoloid cemeteries. In that of Jutas [14] (see Appendix I, col. 52), only five out of twenty-four skulls show any trace of recognizable mongoloid features. The Jutas sample, then, may be used for testing. Fourteen male skulls are all below 78 in cranial index, and are very similar to one of the Minussinsk regional sub-series; less pronounced relationships are present between it and Scythian and Armenian Iron Age skulls. The resemblance to Slavic and Germanic skulls, which are larger, is less pronounced. It is therefore certain that these non-mongoloid Avars belonged to the general Mediterranean racial family, and that some, at least, were members of the Nordic Iron Age group; it is more than likely that they were for the most part incorporated into the Avar ranks in central Asia before coming to Europe. The study of the crania from another cemetery, that of Tiszadersz[15] (see Appendix I, col. 53), makes this virtually certain.

McGovern has discovered a number of Chinese references to the Hiung-Nu and other Turkish-speaking "barbarians" which describe them as hairy, big-nosed, and partially blond. In later times, Genghis Khan was supposed to be red-haired and green-eyed. It is therefore likely that some of the Asiatic Nordic element found in the Jutas and Tiszadersz cemeteries was incorporated by the Avars before they left Mongolia, but, on the basis of the evidence from purely mongoloid cemeteries like Mosonszentjános, it is unlikely that this influence could have penetrated the entire Hunnish and Avar nations.

At any rate, it is evident from the size and number of the Avar cemeteries that, as Bartucz says,[16] these invaders played an important rôle in the peopling not only of Hungary but also of adjacent countries of central Europe, for the people whom the Avars brought into the Danube basin did not depart with the cessation of Avar rule.

At the same time the Avars did not uproot the former population, which

[14] Bartucz, L., **Skythika,** vol. 4, 1931, pp. 75–91.
[15] Lebzelter, V., **MAGW,** vol. 65, 1935, pp. 44–46.
Bartucz, L., **ZFRK,** 1935.
[16] Bartucz, L., **ZFRK,** vol. 1, 1935, pp. 225–240.

included Slavs and Germans, among older elements, but made them tax-paying vassals. Furthermore, in the days of Attila, the richness of the Huns had attracted many craftsmen and adventurers to the royal court, among whom were many Italians. Priscus's account makes it very evident [17] that Attila's capital contained a very heterogeneous population.

The great migration to Hungary, that which brought the ancestors of the present-day Magyars, took place at the end of the ninth and beginning of the tenth century, when the Hungarian national hero Árpád led the Magyars into Hungary, where many Slavs had settled in the interim after the collapse of Hunnish power. We have already seen (p. 220) that these Slavs had partially taken over Hunnish physical traits. By 906 A.D., the Magyars were at home in Hungary; in the two centuries which followed, they adopted Christianity, and invited settlers of many nationalities, including Moslems and Jews, to help them occupy the land. These newcomers, along with the pre-Magyar Slavs, formed a tax-paying peasantry.

The Magyars were Ugrians from the region between the Volga and the Urals, who had been partially Turkicized by the Petchenegs and others, but had retained their Finno-Ugrian language, albeit strongly shot with Turkish. In this respect, they resembled the ancestral Bulgarians, semi-Turkicized Finns, who had, a few decades earlier, crossed the lower Danube and settled Bulgaria, implanting themselves on a population of Slavs who had themselves been but a short while in occupancy. In Bulgaria, the Slavic language seeped through and replaced the Finnish; in Hungary, the Ugrian became dominant and the Slavic speech to a large extent disappeared. Nevertheless, Slavic culture blended with the Ugrian and Turkish, to produce modern Hungarian forms.

We have no physical remains of the early Finnic invaders of Bulgaria, but those of the Ugri of the land-taking period, as the Hungarians call it, are adequate. As is to be expected, these ancestral Magyars, led into Hungary by Árpád, were only mongoloid to a minor degree.[18] Some of the crania which are found in wealthy graves do show definite mongoloid characteristics, but the others for the most part lack them. The majority of the Magyars were of the same Finnish types expected from our previous study of Finns in Russia, while smaller minorities included Dinarics or Armenoids.[19]

At any rate, it was a very mixed population that lived in Hungary during the early Magyar period. On the whole, throwing all elements together, the stature was short and the mean head form mesocephalic.

[17] Brion, M., *Attila, the Scourge of God.*
[18] Bartucz, L., **ZFRK,** 1935.
[19] *Ibid.*
Gáspár, J., **MAGW,** vol. 58, 1928, pp. 129–140.

Since then, the Hungarians have grown rounder headed, as have Russians and southern Germans.

During all the turmoil of the Magyar and Bolgar migrations, the Ugrians who remained in eastern Russia passed relatively unnoticed, but in the thirteenth century or thereabouts they, for some reason, probably new Turkish pressure, crossed the Urals en masse, and established themselves in the western drainage of the Obi. Here they were divided into two tribes, the Voguls, on the immediate slopes of the Urals, and the Ostiaks, in the lower courses of the tributaries and along the Obi itself. In their new home their culture was modified to suit a more rigorous environment, and only those in the southern Obi drainage, at the time of the Russian conquest, still practiced agriculture.

An adequate series of skulls from the time between this eastward migration and the arrival of the Russians about three centuries later shows a mixture between the original Finnish type, with which we have already acquainted ourselves, and Siberian and central Asiatic mongoloids, of the two types already found in the early Hunnish and Avar cemeteries.[20] How much of the mongoloid blood was acquired in Europe, and how much later in Siberia, cannot be determined.

In the Hungarian period of settlement we already become aware of the presence of a new physical type associated with the Turks, who formed a minority in the ranks of the Magyars. When we examine the crania of the Petchenegs and Kumans, in both Hungary and Russia[21] we see that this new type has become the dominant one among these later Turks to arrive in eastern Europe. In it mongoloid features are sometimes present, but in abeyance. The skulls are very large, of moderate height, extremely brachycephalic, and planoccipital. The foreheads are sloping, browridges sometimes heavy, the faces are very broad, and also very long. The orbits are of moderate height. The noses are narrow, and although often low at the root, frequently project at the bridge, giving indication of a convex profile in the living.

These Kuman skulls, as best represented by Debetz's series which includes fourteen adult males, are much longer and broader than historic Armenian skulls,[22] and both longer and broader faced. In height, nose and orbit dimensions, and the tendency to occipital flattening, these two groups are the same. They are also larger than Alpine skulls from central Europe, and far greater in facial dimensions; larger too, than the type B mongoloid crania as represented by a large series of central Asiatic Telengets;

[20] Zaborowski, M., **BSAP**, ser. 4, vol. 9, 1898, pp. 73–111.
Ssilinitsch, J. P., **AFA**, vol. 34, 1903, p. 233, etc.
[21] Bartucz, L., **AF**, vol. 1, 1923, pp. 97–99.
Debetz, G., **AntrM**, vol. 3, 1929, pp. 89–95.
[22] Bunak, V. V., *Crania Armenica.*

much higher vaulted and broader of forehead than the latter, and even a little larger faced.

Thus, the type under consideration, which has become in many regions the characteristic Turkish form, is one which cannot be disposed of by the simple expedient of placing it in an Armenoid or Dinaric category. In size and proportions of the vault, the closest parallel to these skulls is with the British Bronze Age crania; but the resemblance here is far from an identity, for the British faces, although equally broad, are much shorter. In the same sense, the Turkish skulls are reminiscent of the Palaeolithic and Mesolithic brachycephalic types from Europe and North Africa.

Since we know almost nothing of the early skeletal history of central Asia, east of Anau and south of the Minussinsk district, it would be worthless to spend too much time at this point speculating on the immediate origin of this type. As with so many other problems, we must defer its serious consideration to the section on the living, except to point out that in a small series of ten skulls from eastern Russian Turkestan, dated between 600 and 900 A.D., similar but somewhat smaller vault forms are in evidence.[23] At the same time, a few isolated Turkish skulls, from central Siberia, attributed to from the seventh or eighth centuries A.D.,[24] are not unlike the Kuman crania.

After the Huns and Turks came the Mongols, who had been later to adopt the horse culture of the Asiatic plains. Their homeland was around the southern end of Lake Baikal, and they were hunters and fishermen before they became plainsmen. The earliest mention of them in Chinese history occurs in the seventh century A.D., at which time they camped in the country from Urga northward to the forest edge. They are supposed to have sprung from a blue wolf, and from this animal to Genghis Khan was a span of but eight generations.

Their conquest of most of the known world began in the first half of the thirteenth century, and ended two generations later with the death of Genghis Khan's grandson, Kublai Khan. The Mongols were not numerous enough to do all of their conquering alone, and incorporated most of the central Asiatic Turks into their armies. Hence there arose a perplexing welter of Mongolized Turks and Turkicized Mongols, and no doubt of Mongolized as well as Turkicized Iranians. We have no skeletal material adequate to untangle this snarl, but must rely on Mongol and Buryat crania from Mongolia itself to determine their racial type. This was simply the type B of the Huns, in a relatively pure form, as found today particularly among Buryats. Hence the settlement of the Mongols on the

[23] Vishnevsky, B. N., **KMV**, 1921, #1–2.
[24] Gromov, V. I., **ESA**, vol. 1, 1926, pp. 94–99.
Kazantsev, A. I., **RAI**, No. 1–2, 1934, pp. 129–133.

Kalmuck steppe brought the pure, brachycephalic Mongol type to the country around the northern shore of the Black Sea, and into the lower Volga plains, where whole encampments of normal Mongols may still be seen today.

On the whole, the Mongols proper did not influence the racial composition of Europe in the sense that the Turks did. Their influence was sporadic in most of the regions which they crossed, and strong only in southeastern Russia, and in the isolated colonies still living in the Caucasus. Elsewhere it merely served to freshen elements already brought by the Huns and Avars.

Lest this survey of Uralic and Altaic-speaking peoples be incomplete, we must mention still another group, the Samoyeds, who live east of the Ostiaks in the Obi country, and wander along the Arctic shore of Russia as far as the Kola Peninsula, where they meet the Lapps.

The modern Samoyeds, despite their proximity to the Siberian Ugrians, belong for the most part to the central, brachycephalic, mongoloid type; Bartucz's B group, the classical Buryat-mongoloid.[25] Except in modern times, they have had no influence upon the racial composition of northern Europe.

(3) SPEAKERS OF URALIC AND ALTAIC, AND OLD WORLD RACIAL ORIGINS

Before indulging in the speculation which the present study of the Uralic- and Altaic-speaking peoples in antiquity inspires, a brief review of our present knowledge will be in order. Uralic is a linguistic stock or substock which includes Finnic and Ugrian, as well as Samoyedic; Altaic includes Mongolian, Turkish, Tungusic, and possibly Korean.

The Finns and the Ugrians were a united people, in the geographical sense, until the arrival of the Slavs from the west, and Huns and Avars from the east, forced some of them to migrate, and caused the absorption of others. Judging by a series of small samples taken from the heart of their forest abode, they were members of the general Nordic sub-group, most closely related to the Minussinsk people in Siberia, but showing relationships likewise with Scythians and peoples of known Indo-European linguistic affiliation. Thus, since the Finns and Ugrians were not Indo-European speakers, there is no reason to suppose that all of the nomads of central Asia who belonged to this same racial type were Iranians. The Samoyeds, distant linguistic relatives of the Finno-Ugrians, are not represented by early skeletal material, and their racial position in antiquity cannot be established.

[25] Sommier, S., **APA**, vol. 17, 1887, pp. 71–222.
Klimek, S., **APA**, vol. 59, 1929, pp. 13–31.

Of the known Altaic speakers, three branches, the Tungus, Mongols, and the Koreans, were and still are almost purely mongoloid. The fourth branch, that of the Turks, is the only one the racial origin of which is in question. Today most of the Turks are racially European, but in the old days the Huns and Avars, who were intimately concerned with the Turkish expansion, were as mongoloid as the others, with both Tungus and Buryat-Mongol elements represented.

We are at this point squarely faced with the problem of the origin of the living Finns and Turks, and with that of the rôle played by speakers of their linguistic stock or stocks in the formation of European and Asiatic peoples. These problems may not be finally solved with the evidence in our possession. Yet there is enough material, historical, linguistic, and somatological, to make speculation legitimate.

In the foregoing chapter we have seen that the earliest Indo-European languages probably moved westward into central Europe as the speech of the Danubian immigrants as early as 3000 B.C. These Danubian farmers were racially the relatives or descendants of Anatolian and South Russian peoples of a special physical type, a branch of the Mediterranean stock to which we have given the name Danubian. This type was reasonably homogeneous, but the number of skulls upon which its identification is based is slight, and it is possible that a minor increment of longer-headed, narrower-nosed Mediterranean forms accompanied it, since the two variants seem long to have been associated in South Russia.

Now since Indo-European speech was a mixture of B, or Caucasic, with A, or Finno-Ugrian, and since, as we have seen, the earliest known Finno-Ugrians were Nordics with a very strong Danubian tendency, it therefore becomes likely that the Danubian farmers owed their racial type to a mixture of two linguistically different ethnic groups who were physically much the same, and both predominantly Danubian.

If we are correct in identifying the Corded people with the introduction of Altaic speech into Europe, then the further identification of the Corded racial type with (a) the non-mongoloid modern Turks and (b) the Afghanian racial type of the Irano-Afghan plateau, makes it seem possible that there was, in remote food-producing times, an ancestral bloc of peoples living on that plateau who spoke languages ancestral to Altaic, and perhaps remotely related to Uralic, Sumerian, or both. Some of the peoples who formed that bloc presumably moved northward onto the central Asiatic grasslands. This change of scene on the part of these early agriculturalists may have had two effects: the introduction of agriculture into the oases of Turkestan and into Mongolia, and the development of pastoral nomadism by some of the immigrants, with the subsequent rise of the horse culture.

This step in our speculative structure leads logically to the question of the origin of the Turks. Having placed Ural-Altaic-speaking white men, of a special Mediterranean type still found in Iran and Afghanistan, in Turkestan and Mongolia,[26] it is not difficult to suppose that mongoloid peoples, originally hunters, were attracted to the plains from their forests and rivers by the advantages of the new economy, and that they assimilated, in adopting it, those of the white immigrants with whom they were in immediate contact.

In the meanwhile, some of the Altaic-speaking plainsmen, related to the ancestors of the Corded people, may have mixed with smaller Mediterraneans such as were found at Anau, to produce Nordics of the type found in the Minussinsk kurgans, although it is possible that these Nordics do not antedate the arrival of the Iranians. An inruption of relatively unmixed Corded invaders from their eastern center, about 2200 B.C., brought the Altaic linguistic element noted by Nehring in Indo-European speech into central Europe, and produced, by a blending of these Corded invaders with European Danubian racial elements, the European Nordics, who, during the Late Bronze Age and the Iron Age, spread Indo-European speech over a wide area.

In the middle of the second millennium B.C., during the full Bronze Age, one branch of these Indo-European speakers, the Iranians, spread eastward from their home in southern Russia across the country north of the Black Sea into Turkestan, and thence some of them went southward into Afghanistan and India, bearing with them their original cattle and farming culture which they had brought from their earlier home, with a minimum of horse culture elements.

Other Iranians remained on the plains, and took over the horse nomadism which the Altaic speakers had already developed. That they mixed with Altaic speakers, as the legend of the Scythian youths and Amazon maidens would suggest, is probable, owing to their acquisition of a low cranial vault and a wide face, eastern Nordic traits which at this time were foreign to western Europe. The importance of Altaic god names in what is known of the Scythian language would support this contention. These Iranians spread the horse culture westward to the Danube and eastward to China, and pushed those of their Altaic-speaking predecessors whom they had failed to absorb northward and eastward into Siberia and Mongolia.

In Mongolia, about 400 B.C., the horse culture was taken over com-

[26] This is substantiated by the fact that some of the Neolithic skulls from Lake Baikal studied by Debetz are of Mediterranean type, while others resemble those of modern Tungus.

Debetz, G., **RAJ,** vol. 19, 1930, pp. 7–50; **AZM,** vol. 2, 1932, pp. 26–48.

pletely by the fully mongoloid Hiung-Nu, as indicated by Chinese historical documents. The royal and noble families of the Huns and Avars remained purely mongoloid, but their followers in their march to Europe consisted in large measure of these Altaic-speaking white men who accompanied them. The historic Turks are descended in large measure from these Altaic-speaking whites. Some, such as the Kirghiz and the Tatars whose ancestors invaded eastern Russia in historic times, are half mongoloid; others, including the Turkomans, the Azerbaijani Turks, and the truly Turkish element among the Seljuks and Osmanlis, are fully white, since their ancestors had never been subjected to this mixture. A third group, represented today by the Uzbegs and Sarts of Russian Turkestan, and by the pseudo-Armenoid crania found in late Turkish graves in Europe, were a mixture of the old long-headed white strain with central Asiatic Alpines, such as the Tajiks, and to a lesser extent with mongoloids.

Mongols, Turks, and Tungus, living today in the forested northern part of Asia, that is in Siberia, are historically recent intruders who, in response to their new environment, have partially taken over the culture of Palaeasiatic aborigines. Their dispersions may be traced from the Altai Mountains and Mongolia as a center. Their linguistic relationship with each other may be due to varying degrees of acquisition of the speech of the nomadic white peoples who brought the horse culture to Mongolia, or to an earlier diffusion from whites, bringing agriculture to Mongolia, from the same source, or to both. The reindeer-milking complex of the Tungus and Samoyeds, and the reindeer riding of the former, are borrowings from the central Asiatic horse culture.

The two most important steps in the foregoing reconstruction are: (1) the tentative identification of the Corded people with Altaic speech; and (2) the identification of the Corded skeletal type with (a) an element in the Nordic racial complex of Europe, (b) the living as well as ancient inhabitants of Iran and Afghanistan, and (c) the modern Turkomans, Azerbaijani Turks, and the true Turkish strain among living Osmanlis. The induction of the Sumerians into this argument is helpful if true, but not necessary. Some of the Corded cultural paraphernalia had a Sumerian appearance, but this may have been caused by diffusion alone rather than by common ethnic ancestry.

The foregoing hypothesis, in reference to the origin of the Corded people, of the Turks, of the modern Altaic-speaking mongoloids, and of the Sumerians, is pure hypothesis and should not be quoted without the inclusion of a statement that it is offered as speculation only. It is not intended to form a part of the serious contribution of the present study to white racial history. It is included, however, because in the light of existing evidence it seems more likely than any other hypothesis known to the

author which is of equal scope and which purports to explain the same phenomena.

In any case, the question of Uralic and Altaic origins is a part of the white racial problem, and it is intimately connected with the history of Indo-European languages and of the Nordic race. Of two elements in this reconstruction we are reasonably sure; that the ancestors of some of the living Turks, including the Turkomans, Azerbaijanis, and Osmanlis, were always white men, and that the Corded people were racially related to the inhabitants of the Iranian plateau in antiquity.

Chapter VIII

INTRODUCTION TO THE STUDY OF THE LIVING

(1) MATERIALS AND TECHNIQUES

At this point we have completed the survey in which, with the help of the combined disciplines of osteology, archaeology, history, and linguistic science, we have attempted to trace the development of racial entities in the territory occupied by the white race, from the earliest human times to the Middle Ages, the threshold of the modern period. We are now faced with the problem of working with a different body of material—that furnished by the anthropometry of living peoples. We must further attempt to fit this material into the frame furnished us by our study of the dead, so that from the combination of the two a complete and orderly reconstruction will result.

While we were dealing with the data gleaned from the measurement and observation of bones, the chief difficulty which faced us was the lack of adequate samples in most of the periods, regions, and cultural units under consideration. On the other hand, while metrical accuracy was by no means to be assumed, yet the measurements on the dry skulls and long bones were for the most part comparable, and technical difficulty was subordinate to the paucity of documents. In dealing with the living material, however, we have vastly larger samples. In some countries, as in Norway, Sweden, and Poland, these comprise the entire military age group of the nation, and thus cease to be samples in the strict sense, and assume the character of total populations. In relatively few regions is it necessary to use samples of less than one hundred individuals.

Our authority has, therefore, increased immensely. We may speak with some confidence of the superficial physical composition of most European nations. But, at the same time, what we have gained in volume, we have to a certain extent lost in accuracy, for the present state of anthropometry is partly one of confusion and mistrust in regard to technical methods. Despite various attempts in the past and in the present to establish a standard corpus of technique,[1] different schools have arisen in different countries. What discrepancies may exist between the work of members of each school

[1] Cf. The Geneva agreement of 1912; the standards established by R. Martin in his *Lehrbuch der Anthropologie;* the present laudable attempt of Miss Miriam Tildesley to bring about unification.

can usually be determined and allowed for; but this is not the root of the trouble. The chief difficulty is that much measuring has been done not by professional anthropometrists but by amateurs, while some with professional status have not been properly trained. Therefore we cannot be sure that such men belong to any school, nor that they follow any standard other than their own. The accuracy of existing documents on the living is far less than that of skeletal data, and it is not always possible to know what techniques have been used. This lack of consistency is often an obstacle to mathematical comparison, but not enough of an obstacle to render many series wholly useless. We still have a better tool for the study of race in the living than we had in the documents of the dead.

Let us review the more important measurements in which technical difficulties most commonly arise. Stature, unfortunately, heads the list. One would suppose that the maximum height of the body while standing would be a constant dimension and one easy to measure, but neither assumption is true. Some investigators allow the subject to be measured in his shoes, and then attempt to make a standard subtraction for the heel. This is seldom if ever satisfactory. On the other hand barefooted negroes with horny soles are raised up several millimeters by their callouses, when compared to thin-soled white men standing with their shoes removed. Differences in posture, and in degree of conscious stretching, may attain the dimensions of centimeters.

Furthermore, it has been established [2] that the human body, except in senility, shrinks as much as 2.5 cm. during a daytime spent either afoot or in a chair, the amount depending partly on the degree of and nature of the day's activity. It makes some differences, therefore, what time of day the investigator habitually chooses for his work. At the same time the state of nutrition and of health makes some difference, and one must beware of series measured entirely in hospitals.

For the reasons above outlined, and without doubt for others as well, we must not, in studying stature as a statistical criterion of racial value, even if our samples are equivalent in age, expect to find accuracy down to the millimeter. Therefore the common statistical devices used to check the validity of the series on the basis of the sampling process are set at too fine an adjustment in view of the coarseness of the measurement itself, and in view of the great variability caused by factors other than sampling or racial attributes. What applies to stature applies in varying degree to measurements of its segments and of other bodily dimensions; the breadths of the shoulder and hips, and the diameters of the chest, are dependent in some degree on the highly variable amounts of sinew, muscle, and fat present at the points of measurement.

[2] Backman, G., **FUL**, N. F. vol. 29, 1923–24, pp. 255–282.

In the dimensions of the head and face, most of the difficulties found in stature and bodily measurements cease to exist. On the whole, a much greater accuracy is not only possible but has been attained. There are but two important matters in which serious inaccuracies arise with any frequency; these are the measurement of auricular head height and the location of nasion.

The first of these, the measurement of the height of the cranial vault, is without doubt the least satisfactory of all common anthropometric techniques. Although technique #15 of Martin [3] is considered standard, not all use it, and few do it in the same way. Some investigators use special metal head-spanners which measure the height of the vault from the middle of the ear hole, others measure from the top of the ear hole; still others, following Martin, from tragion. There is also a dispute as to whether the height taken should be to the vertex, as stated by Martin, or to a point exactly above the ear hole when the head is held in an approximation to the eye-ear plane.

As a result of these technical difficulties in taking head height on the living, differences of from ten to fifteen millimeters exist between the results of different investigators working on identical populations, and reports embodying these discrepancies are published without comment. Since the difference between techniques is as great as the difference between extremely disparate racial groups of mankind, head height on the living is a useless criterion when employed uncritically. Unless the compiler knows the technical peculiarities and personal equation of each investigator whose work he uses, he should leave this material alone. In the present work, this ruling immediately excludes from consideration the majority of published data on head height.

The second major difficulty, the location of nasion in the living, while not quite as inaccurate, is even more serious, since three important vertical diameters of the face, morphological face height, morphological upper face height, and nose height, are theoretically limited, at their upper boundary, by this landmark; and nasion is an extremely hard point to determine. Ashley-Montagu, however, has recently devised a method which promises to overcome this difficulty in most cases.[4] On adult male whites, luckily, there is usually enough ruggedness of facial relief to make this difficulty less serious than with mongoloids or negroids. Still technical differences of from five to ten millimeters render the works of different investigators incomparable, and one must again be sure of the individual equation of each investigator, or of the school in which he was trained. Since the facial

[3] Martin, R., *Lehrbuch der Anthropologie*, vol. 1, pp. 185–186.

[4] Ashley-Montagu, M. F., **AJPA**, vol. 20, 1935, pp. 81–93; vol. 22, 1937, #3, Suppl. p. 6.

and nasal indices depend upon vertical as well as lateral diameters, and hence upon nasion, these important racial criteria must be taken with great reserve, for the constancy of the lateral diameters serves only to exaggerate, in the indices, the differences between the vertical dimensions.

So much for the most serious metrical difficulties. In measurements on the living we see a more bountiful but less accurate counterpart of the criteria already familiar to the craniologist. There is another large body of data, however, unique in living material; the observations on the soft parts, including such features as hair form, hair texture; skin, hair, and eye color; the shape of the various component segments of the nose, the lips, and the external eye. These are important diagnostic racial characters and deserve as careful study as do measurements and indices. But, unfortunately, accurate comparisons between the work of different investigators is even less possible here than with metrical data, since observation is a matter of judgment, and no two men's judgments are the same.

The use of standard pigment scales in determining hair, skin, and eye color has helped enormously, but has not entirely eliminated the difficulties in the pigmentation field. There is no really adequate eye-color scale on the market, although Martin's series of sixteen glass eyes is far better than nothing. Von Luschan's skin-color scale does not always approximate human shades, and this is especially true with whites. The Saller-Fischer hair-color scale, made from actual human hair, is excellent, in most respects, but has not yet come into common use; the earlier Fischer scale, made of bleached and dyed vicuña hair, is also good.

Unfortunately, however, the majority of our observational data has been collected without reference to scales, and published without accurate definitions, and it is impossible to tell, in many instances, what color or what degree of blondism or pigmentation is implied by a given term. Then too, environment and age make great differences in pigmentation; the degree of tanning or of uncleanliness in regard to the skin color is seldom indicated; eyes often grow lighter with age, and the deposit of fat in the cornea, called *arcus senilis*, which gives a grayish-blue tone to the peripheral zone of the iris, is often mistaken for eye blondism. Hair color is notoriously transitory, changing, in all but pure brunets and extreme blonds, continuously from birth to grayness, baldness, or death.

Most observations, other than those referring to pigmentation and the morphology of the pilous system, are divided into the following categories: absent, sub-medium, medium, pronounced. These are frequently expressed by the symbols, abs., sm., +, ++. Often ssm. and +++ are added for greater refinement. In general, the standard for the + or medium category is a roughly estimated and ideal mean or intermediate white or European male condition. Thus in nasal tip thickness almost all

negroes would be ++ or +++; in beard development almost all Eskimos would be abs., ssm., or sm. There is a tendency for the observer to make the mean condition of the people he is studying + or medium, or to be unconsciously influenced by his own facial form.

Various attempts have been made to standardize these quantitative observations, and the most promising is perhaps that of the Moscow school, where a series of plaster casts has been made to show standard stages of sm., +, and ++ in each of the more commonly studied criteria. Still, whatever standards are used, the location of the borderline between categories must always be a matter of individual judgment.

Our first difficulty with the study of race from existing data on living populations, whether these data be metrical or observational, is therefore one of technical inaccuracy and inconsistency. But it is not the greatest difficulty which will be encountered, and it is not insuperable. The careful compiler can usually discover what are the technical idiosyncracies of a given investigator, and if he is familiar with the material as a whole, he can usually sense improbable divergences from standard technique. The comparison of different samples selected from the same population by different investigators often makes a standard adjustment possible.

Technical inconsistencies and inaccuracies render the study of race on the living something less than an exact science, but it remains something more than a plaything. The manipulation of metrical data requires experience and judgment, and the uncritical use of existing materials on a purely statistical basis, no matter how erudite in the mathematical sense, can never be more than a sterile exercise. Those who employ experience and judgment, and who make a discreet use of the simpler statistical methods, may learn much from the handling of the immense body of anthropometric data.

(2) THE USE OF STATISTICS IN PHYSICAL ANTHROPOLOGY

In the introduction to the study of the skeletal material, we made only the briefest mention of the statistical methods to be employed in that segment of the book.[5] This was done because the numerical size and the nature of the cranial samples employed limited the treatment, in most cases, to a discussion of individual crania and to a comparison of simple means. With the living material however, the use of much larger samples, and of non-metrical soft part criteria, will necessitate reference to more elaborate methods, and therefore a brief allusion to the better known statistical principles and techniques which are commonly employed seems indicated.

Modern physical anthropology, in company with other technical and

[5] Chapter I, pp. 14–15.

biological disciplines, has entered a stage of increasing dependence upon mathematics, and lengthy formulae which involve the use of several alphabets are currently employed by most physical anthropologists. Although there are several schools each of which has assembled a favorite collection of symbols, the method as a whole is a product of the English biometric school founded by Galton and Pearson. Aside from the calculation of means, the purposes for which these formulae and numerical techniques are employed may be reduced to four, which, expressed in the simplest possible form, are as follows:

(1) *To determine the degree of homogeneity or heterogeneity of a given statistical sample, in the various criteria measured or observed, and to compare it in these respects with other samples.*

(2) *To determine whether or not two statistical samples may be considered random selections from a single population.*

(3) *Having found that the two samples represent demonstrably different populations, to determine exactly how different, in a metrical sense, they are.*

(4) *To determine whether or not a given sample is racially mixed, and if it is, to discover its component elements.*

Let us review these four purposes and the techniques by which they are accomplished, in as simple and brief a manner as possible.

(1) *To study the relative variability of samples.* This is done by means of the two constants, standard deviation and coefficient of variation.[6] The former, in which the variability of the extremes is emphasized by the quadratic treatment, indicates how many unit points the average individual in the sample deviates from that mean. When used to compare approximately equivalent means within the same criterion, it is a simple and useful constant. The coefficient of variation is designed to facilitate comparison between criteria in which the metrical values of the means are quite different, in order to eliminate the size element. By comparing σ's and V's of a given sample with those of a general compilation, such as that of Howells,[7] one may gauge the relative variability of the sample, and may compare it with other specific samples in this regard. This technique is

[6] σ (Standard Deviation) $= \sqrt{\frac{fx^2}{N} - \Delta^2}$. V (Coefficient of Variation) $= \frac{100 \cdot \sigma}{M}$.

P. E. M. (Probable error of the mean) $= \frac{.6745\sigma}{\sqrt{N}}$.

P. E. σ (Probable error of the standard deviation) $= \frac{.6745\sigma}{\sqrt{2N}}$.

P. E. V. (Probable error of the coefficient of variation) $= \frac{.6745V}{\sqrt{2N}}$.

P. E. Diff. $= \sqrt{\text{P. E. M.}_1 + \text{P. E. M.}_2}$

[7] Howells, W. W., **HB**, vol. 8, 1936, #4, pp. 592–600.

not by its nature limited to living material, but it may be profitably employed with many more published series of the living than of crania.

(2) *To test the statistical independence of two samples.* The second purpose is, in effect, to tell whether or not two samples may be considered separate statistical entities. The technique most commonly employed is to compare the difference between two means with the probable error * of that difference. If the difference is three times or more its probable error, then the two samples are considered distinct in the criterion under study. If, in a large number of criteria, the two samples are consistently distinct, then two separate populations are represented. If, on the other hand, the two samples are not distinct, owing to the relative smallness of differences compared to their probable errors, then we may make one of the following deductions: (a) the two groups represent the same anthropometric population; (b) the two groups are really different, but owing to the small numerical size of one or both samples, or to the excessive variability of one or both, such a difference cannot be established statistically.

In order to determine which of these two premises is the more likely, the exercise of judgment must inevitably be interpolated. If both samples are large and of reasonable variability, the two are probably, in fact, alike; if both are very small and the probable errors large, the chances are great that the samples are statistically worthless. The chief utility of the sampling check, therefore, is to find out whether or not apparent differences are really of significance. It is not an automatic proof of identity.

(3) *To measure the anthropometric difference between samples.* The third purpose, to tell how close or how distant two samples are in a metrical sense, may be fulfilled in any one of a number of ways. One is merely to compare the means, and to compute the differences. Then, for convenience, one may pool the differences for separate statistical categories. For example, the difference between sample A and sample B in head length may be 4.35 mm.; in head breadth 7.32 mm.; in head height 1.09 mm. The average difference in three vault diameters is therefore 4.19 mm. The average for the same three diameters, between sample A and sample C, on the other hand, may be 9.73 mm. Therefore we may say that sample A resembles sample B, in the totality of three vault diameters, more than it resembles sample C. Similarly one may pool the vault indices, or the head and face measurements, or the head and face indices, but one may not average measurements and indices together. To do so would be to commit the kindergarten fallacy of adding oranges and apples. But there are anthropologists who have not only done this, but who have also added centimeters and millimeters together as equal units, in pooling body and head measurements.

* See footnote 6 on preceding page.

It has long been the wish of many anthropologists to find some means whereby they might express the degree of similarity of difference between two populations by a single figure. Taking population A as zero, B would be, say, 5.6; C = 7.3; D = 11.9. Thus the relationships of B, C, and D in respect to A could be determined. Taking each of the others in turn, it would be possible to triangulate and to plot the mutual relationships of any number of populations in a simple, graphic manner. Morant, working with a formula invented by Pearson, has proposed and employed such a method in the form of the coefficient of racial likeness.[8] Some have accepted this in principle, others have rejected it.[9] Whatever its theoretical validity or error, however, it does actually give approximately the same results as a simple pooling of the several categories of differences. Unfortunately neither a simple pooling nor the coefficient of racial likeness takes into account correlative influences which compel several characters to vary in concert, and thus to weight, in a variable degree, the totality of characters chosen. According to Morant, these correlative influences could be eliminated, but only by an unfeasible amount of statistical labor.

Before proceeding to the fourth purpose, let us pause to make a few reflections upon the uses to which the three systems already outlined may be put. Although all are useful, not one automatically answers any important questions. The first technique, that which is concerned with variability, tells us how variable samples are, but not why they are variable. Unusual variability may indicate an active evolutionary tendency, the recent and as yet not fully amalgamated mixture between two populations, or any one of a number of other causes. Unusual homogeneity, on the other hand, does not necessarily mean racial "purity," in the historical sense, but rather a complete amalgamation and a static evolutionary condition. The second is useful mainly to eliminate from serious consideration statistically inadequate samples. The third gives a detailed idea of degrees of metrical similarity and difference. But neither the second technique nor the third tells the investigator what is the *genetic* relationship between two samples.

(4) *To analyze a racially mixed sample.* Let us now turn to the fourth and last important use which the physical anthropologist makes of statistics. This is his attempt to divide a given sample, which he considers to have resulted from a mixture of races, into its component elements, and to see what these elements are and how much there is of each in the mixture. This is a rather complicated process, and many different methods have been devised to accomplish it.

[8] Morant, G. M., **Biometrika,** vol. 14, 1923, pp. 193–264; vol. 16, 1924, pp. 1–105. Pearson, K., **Biometrika,** vol. 18, 1926, pp. 105–117.
[9] Fisher, R. A., **JRAI,** vol. 66, 1936, pp. 57–63.

One is the system employed by Hooton and his school, in which the author was trained. That is for the anthropometrist, working either with crania or with the living, to divide his series into what seem to him natural groupings, and to specify on each measurement blank which of these types is represented. After the sample has been seriated as a whole, the sub-samples of the different types are seriated separately, and statistically compared with each other and with the total mean. By this means it may be determined whether or not statistically different elements have actually been isolated. If so, the next step is to determine, by comparison, what the larger racial relationships of these elements are.[10] Hooton bases his system on the principle that the individual possesses a racial identity, as well as does the group to which he belongs.

Another method which is less subjective but wholly arbitrary is that of Czekanowski, who plots the mean differences between individuals in a sample on a chequered field; this is done only with indices of the head and face, when the original system is followed.[11] Two individuals alike in all indices chosen produce a black square at the point where their lines intersect; two which are less alike produce a square which is striped, in varying degrees arranged to show the degree of similarity; then those which are dissimilar in all indices are represented by white squares. After these squares have been completely plotted, the graph is rearranged so that those which are naturally related are placed in contiguous positions. In this way it is possible to see how many sub-groups of naturally correlated individuals occur, and how large these sub-groups are. The next step is to find the racial affinities of each sub-group. For this purpose the Polish school has designated a formal list of races, each symbolized by a separate Greek letter, and each equipped with a list of ideal metrical positions in the more commonly used measurements and indices, as well as with a characteristic pigmental position. Each group of correlated black squares in the graph is assigned to one of these races, or to a combination of two or more, and the percentages of each race in the sample is thus worked out.

A third method is that originated by von Eickstedt, the leader of the Breslau School, and amplified by Schwidetzky.[12] This method is to sort the sample directly into sub-series by splitting the distribution frequencies of the characters at arbitrary racial boundaries, and by combining the results of this process as applied to pairs of characters; to plot the

[10] Hooton, E. A., *The Ancient Inhabitants of the Canary Islands; Indians of Pecos;* **Science,** vol. 63, 1926, p. 75.

[11] Czekanowski, J., **MAGW,** vol. 42, 1912, pp. 17–217; **AASF,** ser. A., vol. 25, #2, Helsinki, 1925; **AAnz,** vol. 5, 1928, pp. 335–359.

[12] Eickstedt, E. von, **ZFRK,** vol. 2, 1935, pp. 1–32.
Schwidetzky, I., **ZFRK,** vol. 2, 1935, pp. 32–40; vol. 3, 1936, pp. 46–55.

distribution curves of the sub-series, so-created, for measurements, indices, and percentages of observations; and to test the sorting by a comparison of these curves with others which represent arbitrary racial norms. Like all such systems, this one operates on the assumption that the result of mixing A + B in any metrical character is $\frac{A + B}{2}$.

The three methods outlined above are all based on the principle of correlation. Correlation statistics alone are even more commonly used than any of these. One may correlate metrical characters with each other; metrical characters with indices; either metrical characters or indices with observations, and observations with each other. By means of these correlation statistics one finds which characters are associated, in the sense that their variations are not mutually independent. One finds, for example, that light eyes are usually if not always correlated with light hair. The elements of blondism are to a certain extent linked. One will also find that segments of a dimension are positively correlated with that dimension, but this is of no racial significance. If they are not correlated, or are negatively correlated, then there is something to investigate. One must furthermore expect all gross size diameters to be intercorrelated to some extent in any population, for obvious reasons.

Correlations of racial significance are those which are not dependent on gross size and are not involved in a part-and-whole relationship. Thus, if tall stature goes with blond hair and short stature with dark hair, or if a broad nose goes with a low relative sitting height, and vice versa, then the anthropologist who is analyzing his series assumes that he has uncovered linkages showing racial variations within his sample.

There is no possible objection to the use of correlations, but there are many objections to the ways in which they are often interpreted. In the first place, a valid correlation implies some degree of genetic linkage. But it does not necessarily imply that this linkage represents with complete fidelity a combination found in one component element in a hypothetical mixture. There may have been no mixture at all—the group may be evolving, by mutation, in a certain direction which involves more than a single character. Or if there has been mixture, the correlation may represent a recombination of characters.

Correlation, in brief, shows linkage, but what does linkage mean? We must not forget that a population, in the physical as well as in the social sense, has an existence of its own in addition to and above the existences of its component units, and we must not, furthermore, anticipate the findings of the geneticists. All of the methods which partition a series, or which employ the principle of correlation, have some justification in their initial steps, and some utility, but all of them become unscientific as soon

as general biological principles are forgotten and arbitrary assumptions are allowed to creep into the process of interpretation.

At this point we must repeat the premise upon which the whole technique of the present book is based: *The study of race in man is as much a social and historical as a biological discipline.* Out of his environment man creates his cultural milieu, and his cultural milieu, as we are becoming increasingly aware,[13] alters his physical nature. When we shall have discovered some of the laws which govern human inheritance and human change, we may become much more mathematical than is fitting at present. Laws in biology and in its sub-division sociology, when once understood, are seen to be as invariable and as valid as laws in physics. But we cannot, and we should not attempt it, remove the study of human racial taxonomy from the dimensions of cultural milieu and of history. We may and must employ a statistical method, but let it be one tempered with simplicity and discrimination, since mathematics to us is not an end but a tool.

(3) DISTRIBUTION OF BODILY CHARACTERS

(a) *Stature and Bodily Form*

Before venturing to draw up a schematic classification of races within the white family, let us review some of the better known racial criteria from the standpoint of spatial distribution. The use of maps to show the distribution of means in a single metrical character is one of the oldest and commonest illustrative devices employed in the study of race. It has, in fact, formed the basis for several systems of racial classification, based upon geographical correlations between two or more characters. Such classifications ignore individual linkages in the characters involved, and subordinate the position of the individual as a racial entity. They are of necessity based on few characters, and the races so postulated are correspondingly ill defined.[14] This abuse of cartography should not, however, hinder the use of maps in a purely demonstrative sense.

In this and the two following sections, we present four such maps, representing the distributions of stature, the cephalic index, head size, and hair and eye pigmentation.[15] These four characters were chosen from the total body of criteria because they are the only ones in which it is possible to overcome, to a satisfactory degree, the obstacles of paucity of data

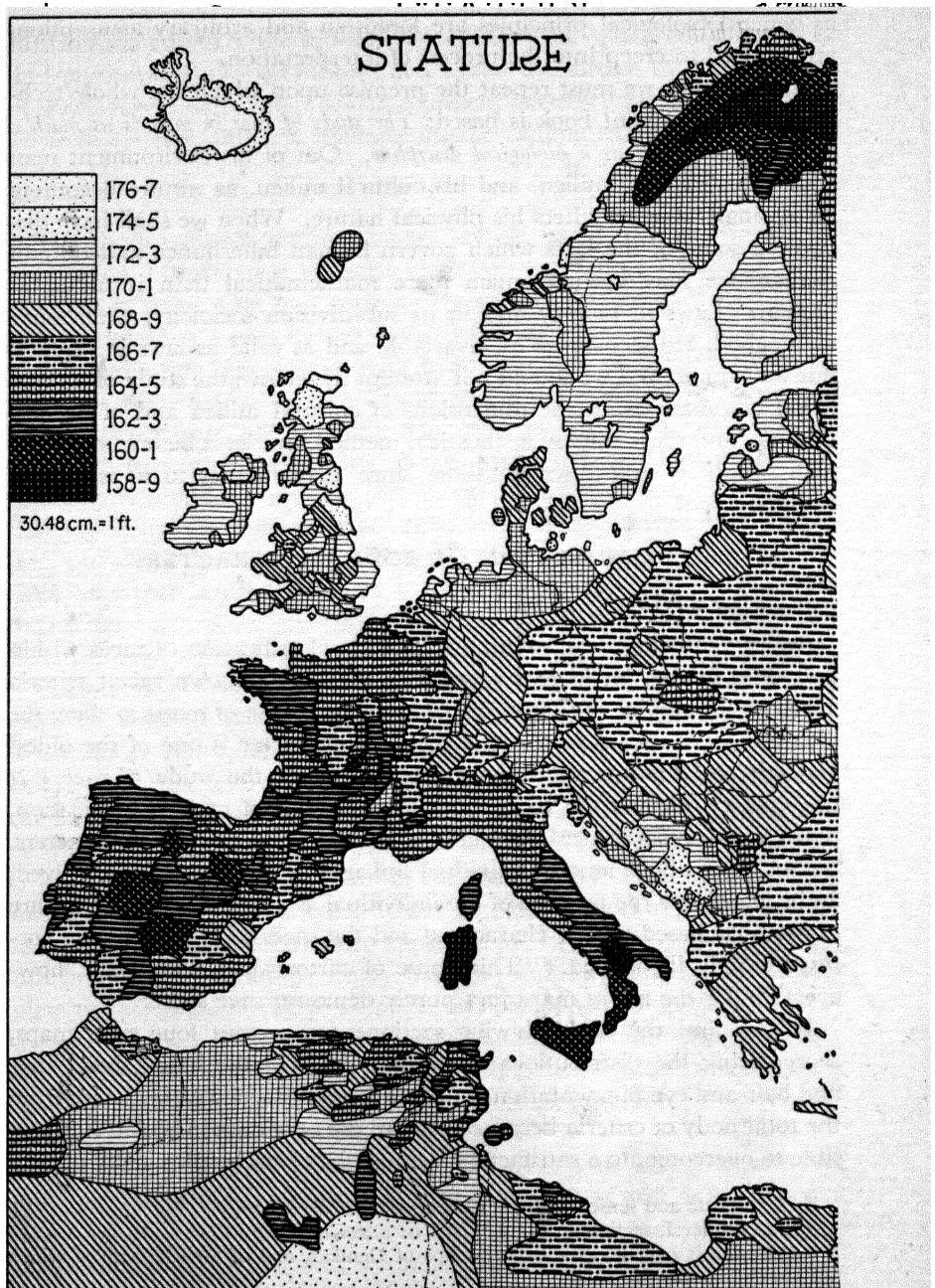
[13] Cf. the title and sense of Childe's book, *Man Makes Himself.*

[14] See Chapter I, section 3.

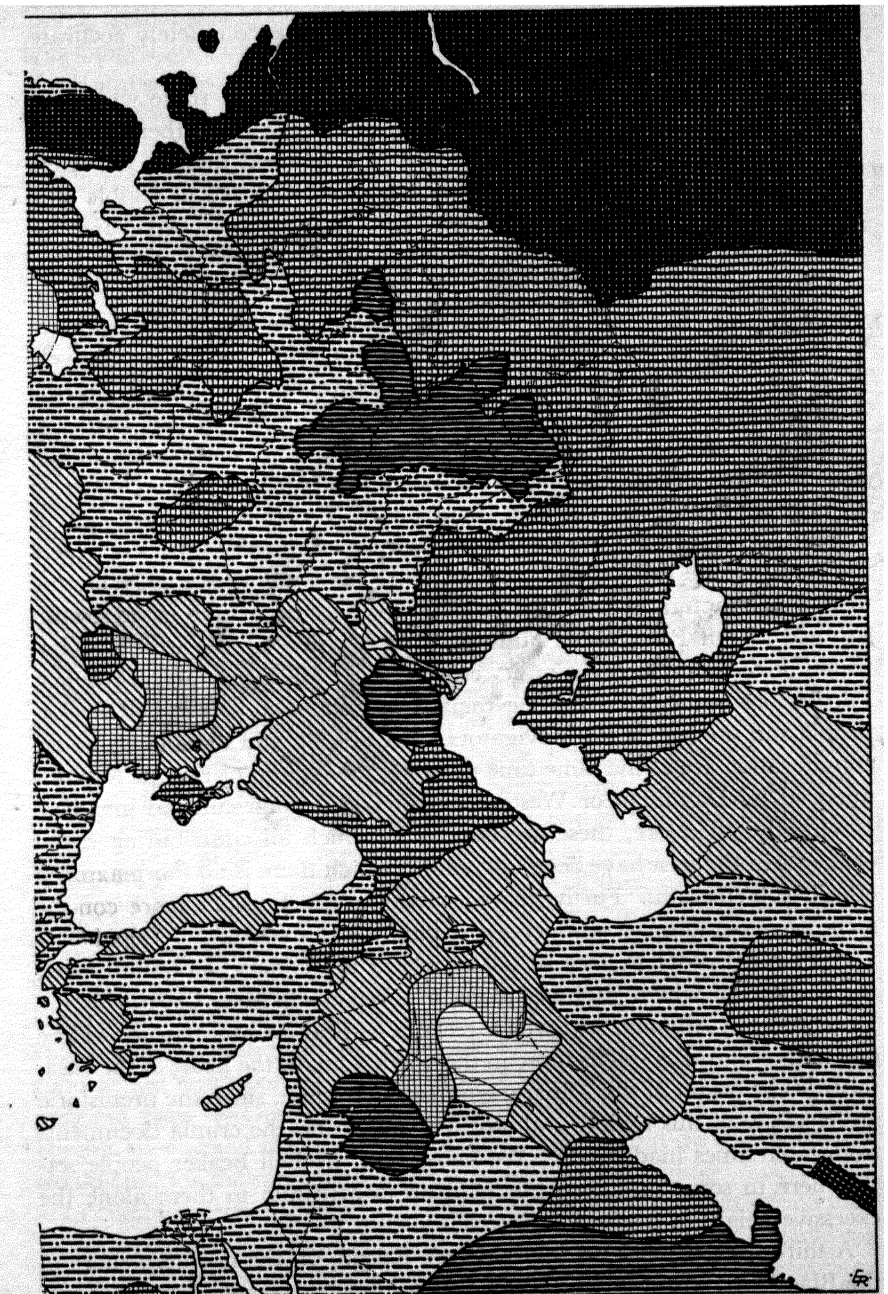
[15] Attention is called to the earlier maps of Deniker, and of Struck, both of which have been extensively copied.

Deniker, J., **JRAI**, vol. 34, NS 7, 1904, pp. 181–206.

Günther, H., *Rassenkunde des deutschen Volkes*, pp. 216–217. (Early reproduction of Struck's maps.)


STATURE
176-7
174-5
172-3
170-1
168-9
166-7
164-5
162-3
160-1
158-9
30.48 cm. = 1 ft.

MAP



5

and technical inconsistency. Not one of the four is completely accurate, but all are accurate enough for present purposes.

In the first of these, the stature map (Map 5), as in those which follow, boundaries between provinces, linguistic areas, and other ethnic or political units have been simplified, and schematized to such an extent that the smallest spatial unit recognized is one capable of legible stippling. Nomadic territories in North Africa, southwestern Asia, and the far north, have received an even more schematic treatment.

The first impression which one receives while examining this map is that there seems no orderly scheme; that, except for the stunted circumpolar belt, there seem to be no widespread zones of stature. A relatively large and consistent area of tall stature, however, is comprised by the Scandinavian Peninsula, most of the land area of the British Isles, the Netherlands, Finland, the Baltic states, and parts of northern Germany. This northwestern European center of tallness is commonly referred to in anthropological literature as the primary Nordic racial zone.[16] It is difficult, however, to agree that the tall stature of these countries is largely the result of the presence of Nordics, since its existence seems to be due to multiple factors. Historically, this is precisely the region of maximum survival of tall Palaeolithic hunters, while Corded people were concentrated in certain sections of it, especially in Denmark and Esthonia. Furthermore other contributing racial elements, such as the Bell Beaker people and the Megalithic navigators, were all tall, and these lands under consideration are at the same time precisely the regions of Europe least influenced by Danubian or Western Mediterranean agricultural invaders. Essentially, therefore, these are regions in which all contributing racial elements in the past have been tall, and in which there is no short-statured ethnic sub-stratum. Furthermore, northwestern Europe has been the scene of maximum stature increase during the last century.

A second European area of tall stature is the Dinaric mountain zone, the nucleus of which stretches along a narrow belt from Croatia to the Drin River in Albania, and which reaches its peak in Montenegro. Here one finds statures as tall as those in the north, and, in the heart of the area, taller. The origin of this Dinaric giantism is obscure, since the prehistoric archaeology of this region is almost unknown, and the crania documents from later times inadequate. We know that the Bell Beaker people settled here in some numbers, but hesitate to attribute to them alone the excessive height of modern Dinarics.

A third area is found in southwestern Russia, on the northern shore of the Black Sea, in the Ukraine; here Atlanto-Mediterranean factors seem

[16] De Geer, S., "The Kernel Area of the Nordic Race within Northern Europe," in Lundborg, H., and Linders, F., *Racial Character of the Swedish Nation.*

largely responsible. On Asiatic territory the countries occupied by the non-mongoloid Turkomans and by the Iranian-speaking Kurds are seats of tall stature, as is the kingdom of Iraq, whose inhabitants have been tall since the days of the Sumerians.

One other principal area of tall stature, which is merely suggested within the limitations of the present map, is the Hamitic center located in East Africa. One recalls the giantism of the pluvial inhabitants of Kenya, which has apparently been perpetuated in the great height of living Hamites who inhabit the Horn of Africa and the western shore of the Red Sea. The most thoroughly Hamitic of the North African Berbers, the Tuareg, are as tall as northwestern Europeans. The tall stature zone of northern Africa is centered in regions of the Sahara occupied by nomadic Berbers, and extends itself into the fertile stretch of Africa Minor where these people have settled after invasions.

Turning to the consideration of short stature, we find that, aside from the far north and the territories occupied by recent Mongol invaders, it is concentrated today in the very regions most affected by early Neolithic migrations of short, food-producing Mediterraneans—namely, the western Mediterranean countries, from central France to Sicily, and the Danubian culture area, especially in its eastern and trans-Carpathian segment.

In general, one cannot over-simplify a distribution map dealing with a character as complex as stature, since south of the Arctic circle there are no large zones or major trends, and in most of the sub-areas a complicated sequence of historical events has taken place which has brought in a succession of peoples with different statures. Furthermore, different environmental stimuli operating in various places and at varying times have further served to complicate the picture.

The distributions of weight and bodily form, if these criteria could also be completely plotted, would make maps as interesting as that of stature. What information we possess suggests that they would be much simpler and more easily interpreted. In weight, for example, there would be one large zone in which the adult males in middle life would average over 150 pounds, with individuals in the two hundred class common, and this zone would correspond to the northwestern area of tall stature, and to adjacent parts of Germany, Holland, and Belgium. The center of the Dinaric zone would likewise be one of heavy weights, but the rest of Europe would run, for the most part, at least twenty pounds lighter.

In the long stretch of arid countries reaching across North Africa and Egypt into Arabia, Iraq, Iran, and Afghanistan, light weights would be the rule, regardless of stature, and this would likewise be a zone of predominantly linear, or long and narrow, bodily habitus. Stocky build, on the other hand, would also be found to have little relationship to stature,

since some of the tallest northern peoples and some of the Dinarics would be plotted as lateral. Sex differences in both stature and gross size would be found greatest in northwestern Europe, as among Upper Palaeolithic peoples, and least in eastern Europe and among western Mediterraneans. In general total bulk, regardless of stature, seems partly a function of environment, and excessive bodily volume is suggestively centered in cool, damp regions, while thin, light-bodied people are most frequently encountered in deserts. Great differences in size between the sexes seem commoner among large than among small peoples, and are most pronounced in the regions where Upper Palaeolithic strains survive in most concentrated solution.

(4) DISTRIBUTION OF BODILY CHARACTERS

(b) *Head Form, Head Size, and Other Metrical Characters of the Head and Face*

Next to stature, which is of interest to many others besides anthropologists, our data are fullest on the cephalic index, for this ratio has been the favorite of both professional and amateur students of race ever since its invention by Retzius in 1842. The same remarks on the method of plotting the stature map apply to that of the cephalic index (Map 6). Here the only region of comparative uncertainty lies in the southeastern corner, in Iran, where some rather extensive boundary stretching has been practiced.

The distribution of the cephalic index within the area covered by this map is a complex affair, and cannot be interpreted hastily. Many factors and many events have contributed to this state of complexity, which the map only partly represents. One must remember that, as in the stature map, the scattered bands and villages of Lapps have been schematically united into a nucleus in northern Scandinavia, Finland, and the Kola Peninsula. Furthermore minority groups such as Jews, Gypsies, and others, have been omitted, since in no region large enough for schematic representation are they found in a majority.

The most striking feature of the map, and in fact, almost its only uniformity, is the steady band of almost pure dolichocephaly which extends south of the Mediterranean from the Atlantic coast of Morocco across North Africa, Egypt, Arabia, and Persia into Afghanistan; to continue, off the map, over Khyber Pass and into the Indus Valley. This band represents the greater Mediterranean race in its post-Pleistocene homeland. Small spots of mesocephaly in the Moroccan mountains, in Kabylia and in the Aures, and along the Tunisian coast, show the relatively restricted zones of survival of earlier Mediterranean mesocephals and, to a lesser extent, of Pleistocene North African men; except for the Tunisian

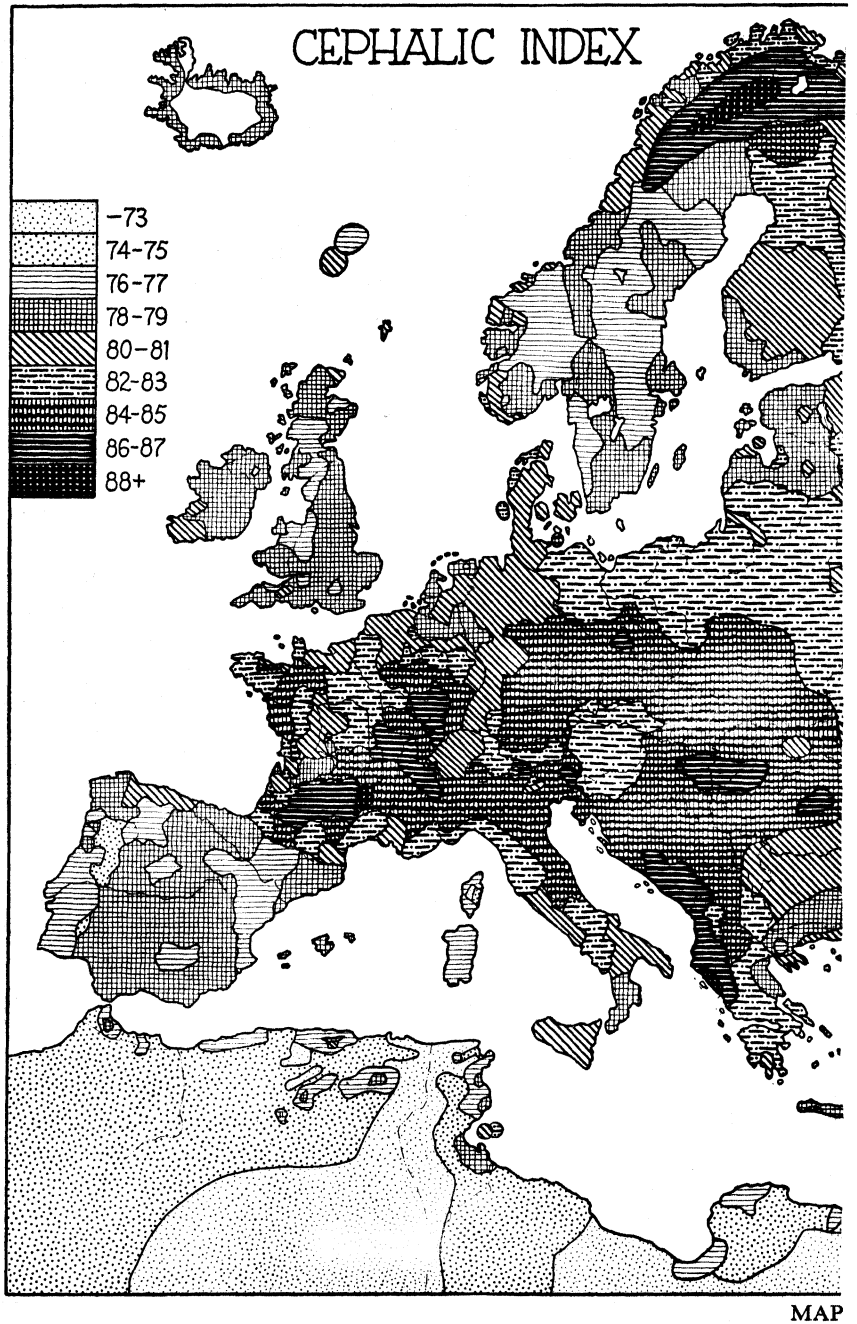
coastal centers, where the strong concentration of Punic and European populations in pre-Arab times is no doubt partly responsible.

The extreme long heads, concentrated in the Hoggar and in parts of the Algerian plateau, are the Tuareg and the purer families of ancestral nomadic Berbers, preserving the head form which they brought from East Africa, their Hamitic homeland. The heavily dotted stipple represents Mediterraneans of Neolithic age and Arabs, with an infusion of the Hamites, while the light dotting represents more clearly the Hamites themselves. This is a distinction which should not be pressed too far, but which may still be made, for the lightest stippling is found in nomadic Berber strongholds.

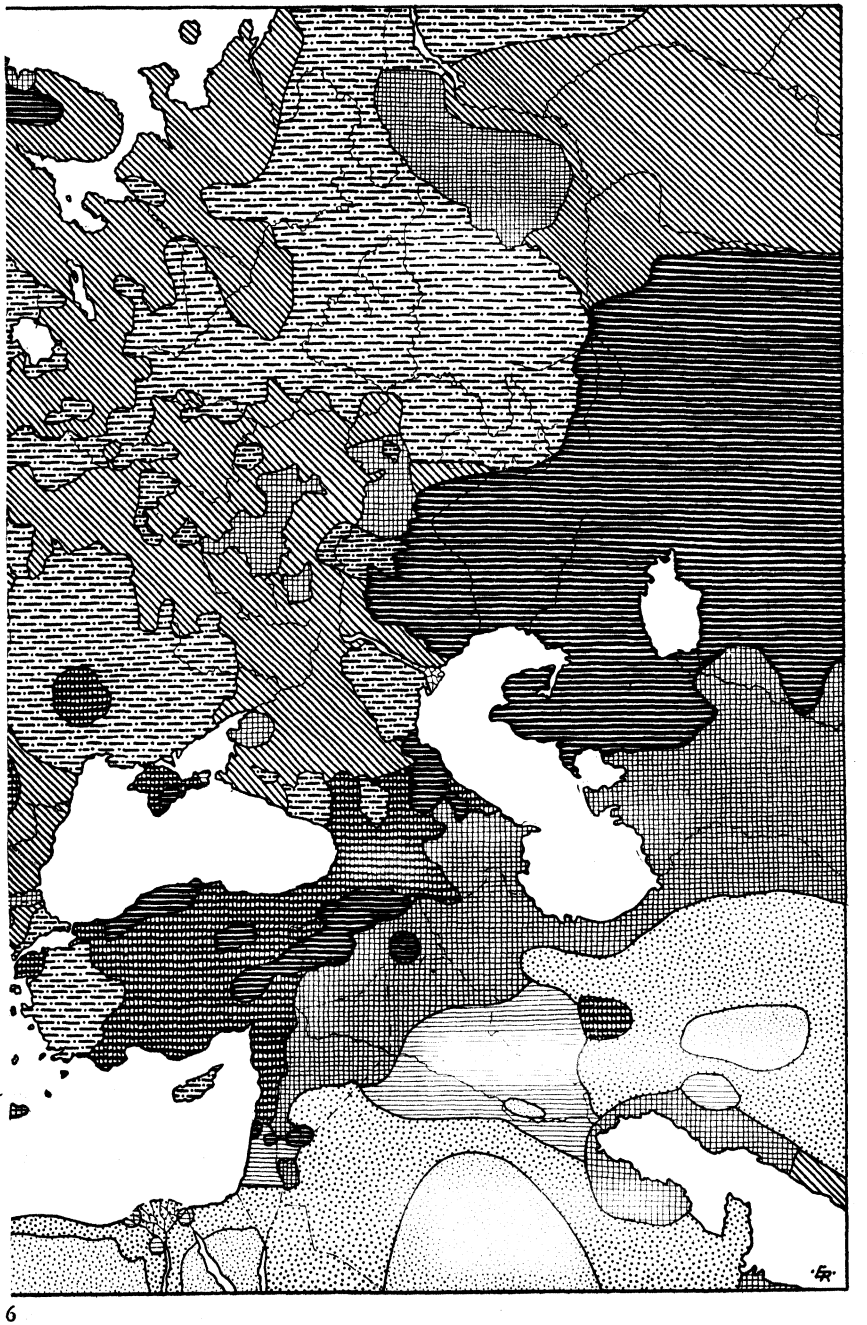
Farther east the desert tribes of Libya, and the oasis people of Siwa, are extremely long-headed, in a truly Hamitic fashion; the inhabitants of Sinai, and some of the tribes in the Nejd, as some of the Mesopotamian Bedawin, and groups in Iran, fall into the same category. Here in the east we approach the zone of hooked-nosed long heads, quite different in facial form from the Hamitic increment farther west. Around the Persian Gulf is a ring of higher indices, representing a maritime population which we shall encounter later in the coastlands of southern Arabia, off the present map. The long headedness of inland Arabs, whether nomadic or agricultural, continues without a break south of the present map into Yemen and to the northern and western borders of the Ruba' el Khali.

In Europe itself, long-headed total populations are rare. Only in parts of Portugal, in fact, are regional indices under 76 to be found at all. Europe on the whole is a brachycephalic or mesocephalic continent. Mean indices between 76 and 79, belonging to high dolichocephals and low mesocephals with brachycephals in the minority, are found in a few places. One, the most continuous area, lies in the northwest; it includes the British Isles, most of Holland, parts of Belgium, and the Palatinate—old Frankish country—and most of the Scandinavian Peninsula, along with the coastal lands of Finland, and with Esthonia and Latvia.

The regions just enumerated may be considered in a way a unit; most authorities would call this, as with stature, the Nordic racial territory, and so it is in the accepted sense. Another belt is that of the Iberian Peninsula, the Dordogne Valley in France, Sardinia, Corsica, the Balearics, the toe of Italy, and Crete. To this may perhaps be added part of the corresponding area in the British Isles, and parts of the eastern site of the Balkan Peninsula. This is what remains of the brunet Mediterranean race *per se* in Europe; isolated island groups, a peninsula which throughout history has been more African than European, and remnants of the old Mediterranean bloc of the shores of the Black Sea and the Aegean.



MAP



6

Where, we ask, are the descendants of the Danubians, the Aunjetitz Nordics, and their Iron Age successors in eastern and central Europe? Only in the mesocephalic belt across eastern central Russia, and the region immediately north of the Caucasus, and again in the central and eastern Balkans, do traces of the original head form of these peoples appear, emerging as that of a population bound to the soil. Perhaps in the tall stature and high mesocephaly of the Don country there is also some trace of the Scythians. The country between the northern shores of the Caspian and the middle Baltic does indeed form a zone of relative long headedness between the mongoloid brachycephaly of central Asia and the European brachycephaly of central Europe.

This central European brachycephaly may not be treated as a completely unified entity. In the first place, we find its westernmost nucleus in southern France in the Massif Central, which is the home of the Alpine race in its truest form. Here extreme round headedness such as is seldom exceeded elsewhere in the world is located. The valley of the Rhône forms a partial gap, beyond which lies another brachycephalic zone in eastern France, especially in Burgundy and the Jura, and adjacent portions of Belgium. Here again we find a high zone of brachycephaly, accompanied, as we have seen, with a greater stature than that found in the western Alps, and as we shall see later, a lighter pigmentation. Here is another brachycephalic nucleus representing a different racial concretion from that first mentioned. One observes that in the upper Rhine Valley and in northwestern Switzerland, as in Lower Austria, this zone of extreme brachycephaly is broken, while a northern colony of it is found in Bavaria, Bohemia, and Silesia.

In the Tyrol, southeastern Switzerland, and most of northern Italy is another nucleus, which is the home of the western branch of the Dinaric group, associated largely with the center of Rhaeto-Roman speech. These linguistic fossils are survivors of the pre-Germanic population of this region. Most of Austria itself runs longer headed, owing, no doubt, to the strong concentration of Germanic peoples there. The Dinaric region proper, extending from Bosnia to southern Albania, follows the mountain range, which in turn lies close to the Adriatic coast. The center of highest brachycephaly lies in southern Albania, in the Tosc country, well south of the center of tallest stature. The southern brachycephalic zone, of which it is the nucleus, extends far into Greece, along the western coast, from Epirus to the Gulf of Corinth.

The curve of the Carpathians forms a brachycephalic barrier, within which all peoples represented, except for the Hungarian Szeklers, are very round headed. This infra-Carpathian brachycephaly pervades all other groups regardless of language, culture, or history. Beyond it lies

the relatively long-headed expanse of the Polish, Ukrainian, and Moldavian plain.

As we turn to Asia Minor we see other instances of extreme regional brachycephaly. The Armenians, some of the Syrians, especially the Alouites, Lebanese, and Druses, are the roundest headed of all in this region. The Anatolian Turks, being typically brachycephalic, in this respect resemble modern representatives of the pre-Turkish peoples, of this region, notably the Armenians.

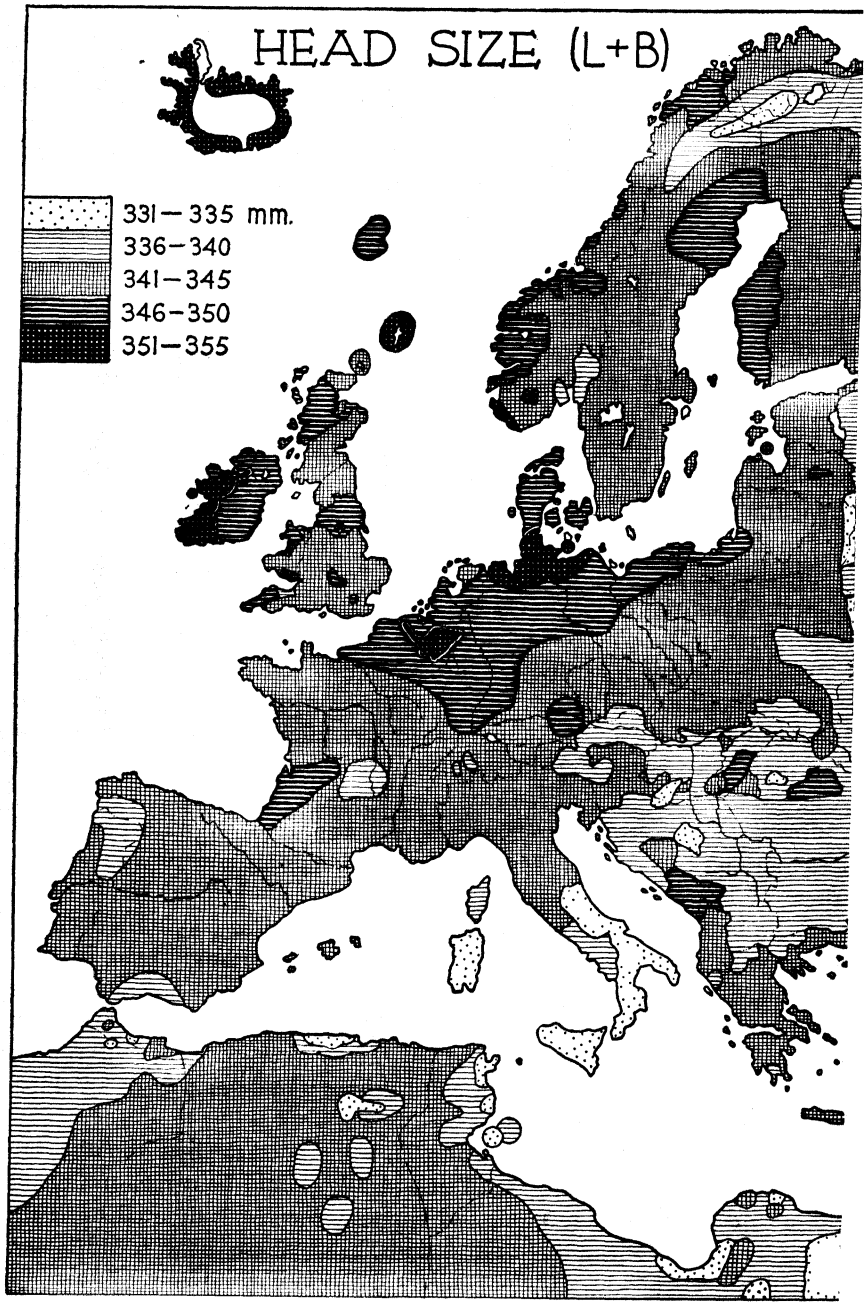
The cephalic index map, like that of stature, shows that the Mediterranean Sea is by no means a racial unit. Some of the lowest and some of the highest cephalic indices in the world are found in close proximity to its shores. Another notable lack of continuity is seen in the far north. The hunting and fishing peoples, so consistently short of stature, are very variable in head form. The Lapps alone are consistently and extremely brachycephalic. The original mesocephalic head form typical of the Finns in their native habitat may still be observed in the regions occupied by Finnish survivals in central and northern Russia.

On the whole, the distribution of the cephalic index in Europe and adjacent countries is extremely significant when one remembers the historical and archaeological background, but viewing its present distribution alone one might easily form numerous false ideas about racial origins and continuities. It is sufficiently clear, however, that the zone of extreme brachycephaly in central Europe has several nuclei, and is separate from the Anatolian-Caucasic center and from that of the mongoloids of central Asia.

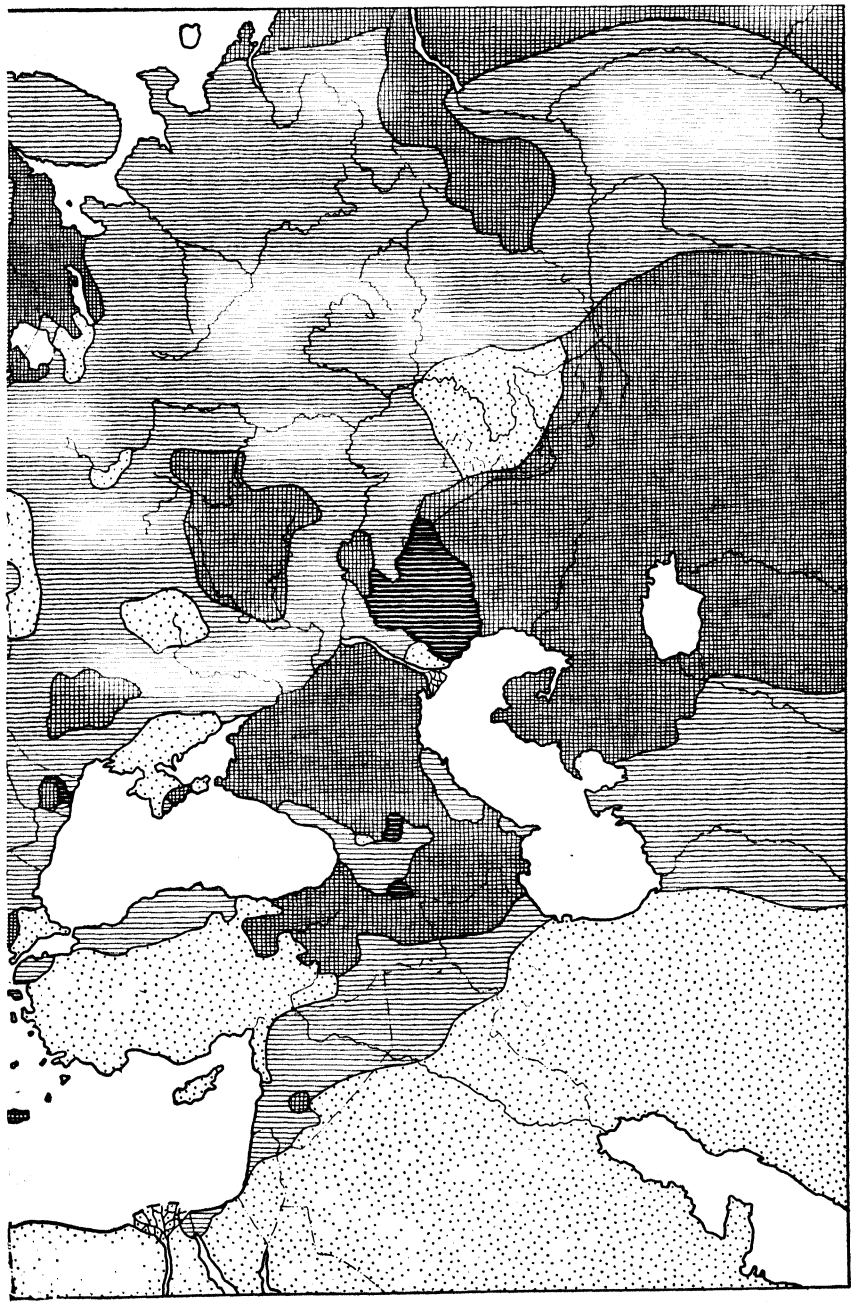
One last factor remains to be mentioned, and this is the ultra-peripheral distribution of moderately high cephalic indices on the very westernmost fringe of Europe. One notices that southwestern Ireland has a mean cephalic index of 80 or over. Little spots of this same condition occur in northern Scotland, the Shetlands, the West Frisian island chain, in Fehmarn, and in points along the western Norwegian coast. This hypermarginal brachycephaly is peripheral to the dolichocephaly of northwestern Europe, which in its turn is a survival. The suggestion is that this round-headed tendency of the extreme western fringe is in the nature of a Palaeolithic reëmergence.

The third map of this series (Map 7), is intended to show the distribution of absolute head size. Head size ideally should be a measure of the cubic capacity of the cranium, and capacity may be estimated upon the living by the use of the three dimensions, head length, head breadth, and auricular head height. Unfortunately, however, as already explained,[17] auricular head height is for the most part an unreliable measurement,

[17] Page 243.



MAP



7

and it would not be possible to construct a map covering a large area in which this was a component dimension. For this reason head size is here expressed simply by the sum of the length and breadth in each sample used. It so happens that large heads in the length-breadth sense are frequently high heads as well, so that there is little chance that the omission of the height dimension has falsified the appearance of head size conditions.

Head size is, in the first place, wholly unrelated to head form. Some of the largest heads are found among both dolichocephals and brachycephals, and the same is true of some of the smallest heads. It seems, however, to be closely correlated with total bodily bulk, and hence with weight, although not with stature.[18] This principle applies to other animals as well as to man. Brain size is, after all, a component element of bodily bulk, and the requirements of the organism in the matter of nerve tissue depend apparently upon total size rather than upon the relative degree of attenuation of extremities. We have seen that cranial size is an important racial diagnostic in the cranium, and there is every evidence that it is equally important in the living.

The map which shows the distribution of this trait is not, however, as reliable as the two which precede it. Lacunae have been filled in accordance with general racial trends and by the conversion of modern cranial material to living standards by fixed additions to allow for the soft parts.[19] The areas which are least reliable are Portugal, Spain, much of France, and portions of western Germany. The Balearics and Sicily were filled in by inference. However, the data are sufficient to assure us that the general picture is correct, although the boundaries may well be inaccurate. The map will serve our purpose, and cannot lead us far astray, if we do not lean too heavily on it, or follow it in too much detail.

The first impression that the map gives is one of a concentric distribution of head size with Germany, Belgium, and northern France as the focus of greatest volume. From this focus bands of diminishing size stretch like bars dexter to the Persian Gulf. This pattern is broken in the Middle East by the intrusion of relatively large-headed mongoloid peoples from central Asia, and of non-mongoloid dolichocephalic Turkomans, Azerbaijanis, and Kurds.

Studied in greater detail, where detail is justified, this basic pattern does not break down, but other facts appear. In the first place, Ireland

[18] Du Bois, E., **CRIC**, 1934, pp. 71–75; also, Marett, J., p. 129.
[19] Duckworth, W. L. H., **JAPL**, vol. 51, 1917, pp. 167–179.
Fischer, E., **MAGW**, vol. 36, 1906, pp. 54–57.
Gladstone, R. J., **Biometrika**, vol. 4, 1905/6, pp. 105–123.
Mies, J., **MAGW**, vol. 20, 1890, pp. 37–49.
Weisbach, A., **MAGW**, vol. 19, 1889, pp. 198–200.

as a whole has the largest heads of any country excepting Belgium. A vertical line divides Ireland into a western, and especially southwestern half, with heads as large as the largest elsewhere, and an eastern, and especially northeastern, half with heads which although smaller, are still large by European standards. Iceland again is an area of maximum head size, and so are the Shetland Islands. Small regions of large head size appear along the Norwegian coast. The regions mentioned in this paragraph undoubtedly represent the maximum survival of Pleistocene European man of the Brünn race in the northwestern portion of the continent. They coincide to a certain extent with the hypermarginal distribution of high mesocephaly and low brachycephaly.

But there remains the bloc of large heads running from the Seine to East Prussia, and concentrated in Belgium and in the lower Elbe country. Here large heads are associated with brachycephaly, of varying degrees, but usually of a moderate order. This region has a much larger-headed population than has most of Sweden and Norway, and most of England and Lowland Scotland. The brachycephals of this large continental bloc all have head lengths which elsewhere go with dolichocephaly. The Fehmarn islanders, for example, whose small home is just south of the Danish Archipelago, have a mean head length of 193.5 mm., and a cephalic index of 83.6.[20] Their head breadth of 161.8 mm. is tremendous. In our historical chapters, we encountered but one racial type which consistently presented the combination of brachycephaly with great head lengths. That was the type found at Afalou and Ofnet, and in the Danish middens, and which was given the name Borreby. As will be seen later, the Borreby race has reëmerged in the country where it was located during the Mesolithic and Neolithic periods, and it has become the most important single racial element in modern Germany.

Palaeolithic and perhaps Corded survivals are to be seen in the large heads of the Finnish coast and northeastern Sweden; the track of German colonists in late mediaeval times is evident in Hungary and Rumania. The Basques have heads of considerable size also, and there seems to be a significant nucleus of large heads in the Dordogne, where, as will be seen later, a long-headed, brunet Upper Palaeolithic survival seems indicated, as in west-central Wales.

The zone of moderate head size lying between Germany and Poland on the one hand, and eastern Russia and the Caucasus on the other, seems to reflect an earlier Danubian and Nordic condition. In North Africa and southern Italy, small or medium-sized heads seem marginal and go with the older Neolithic Mediterranean element. The Hamites

[20] Saller, K., *Die Fehmarner*, **DRK**, vol. 4, 1930.

brought larger heads, such as are to be found today among Galla,[21] and among other predominantly Hamitic peoples.

The tendency of the Hamites to large head size has divided the erstwhile unified Mediterranean racial zone, which stretches across the whole lower quarter of the map, into a western and an eastern compartment. The eastern sector, from Cyrenaica to India, shows the small head size which apparently formed a cranial interlude in North African history between the end of the Capsian and the Hamitic invasions. As one leaves the map and passes into southern Arabia and Baluchistan, the heads grow smaller than any here designated. Here total length-breadth combinations of 328 mm. are found in the Hadhramaut and among Brahui. This zone which stretches along the northwestern shore of the Indian Ocean is part of the so-called Veddoid racial area, which does not extend into Europe or any region nearly approaching it. The racial character of the people inhabiting this zone can best be described in a more detailed chapter to follow.

One of the most important results of the plotting of the head-size map is the discovery that the brachycephals of the white race and of Europe are not at all a unit in this respect, since they follow general racial zones which have no reference to head form. One may divide them into several sub-groups on the basis of head size alone. The Lapps, who in their pure form are hyperbrachycephalic, have very small heads. The other brachycephals of northern Europe, those concentrated in Germany, southern Denmark, Belgium, and France, form the largest-headed group. These may be considered, tentatively at least, of Borreby derivation or inspiration. The Alpines of the Massif Central in France separate themselves clearly from this nucleus, with an emphasis on moderate head size. Although the regional data in France is poor, in this case it is sufficient to warrant the present conclusion. The Dinarics are also moderate in head size, despite the coincidence of taller stature; only the Montenegrins themselves and the Albanians north of the Drin have truly large heads. The extreme hyperbrachycephals of southern Albania and Epirus are again of medium head size, like the Central French Alpines. The brachycephals of the Hungarian plain, and of the Carpathians, are for the most part also moderate.

When we leave Europe and move to western Asia, we find that the Asiatic Dinarics and the so-called Armenoids are in some areas smaller headed than the European Dinarics; the Armenians themselves have heads approaching Dinaric standards, but they vary regionally, with the largest heads in the northeast, toward the Caucasus. The brachycephalic Turks of Asia Minor are actually small headed, as are most of the Syrian brachycephals and the Iranian-speaking round heads of the Pamirs. The

[21] Unpublished data in author's possession.

fringe of round heads along the southern Arabian, Persian, and Baluchistan coasts are very small headed, in a quite un-European sense.

What are we to make of all this? The answer cannot be given as yet in final form, but several suggestions present themselves.

(1) Head size, being a correlate of gross bulk, seems in general to be associated with regions of relative chill and humidity, all else being equal. The water content of the human body is greater where evaporation is least. In this way the flaccid Teutons and the fog-wreathed Irish in their moors and bogs have the heaviest bodies and the largest heads, while the indigo-stained Arabs, living on the utmost margin of desiccation, reach the opposite extreme in liquid economy. Man is not a water-storing creature, like the cactus and the camel.

(2) The largest-headed peoples are unreduced survivors or counterparts of Upper Palaeolithic man, who was a large-headed and presumably large-bodied animal. This applies both to dolichocephals and brachycephals. Brachycephaly is a mutative incident which may occur in any region or race, and head size may be more important than head form as an indication of ultimate genetic derivation, again all else being equal.

It seems to me that somewhere between these two hypotheses lies the truth. Environment, which in the last analysis controls body size, must also eventually control the bulk of the head. But at the same time, genetic tendencies to absolute head size are inheritable, and without regard to head form. Hence early racial connections, under equal environmental conditions, may be better revealed by the size than by the shape of the vault. The heads of some people have remained constant in size and form; others have been reduced, brachycephalized, or both. But brachycephalization may take place without reference to body size, while reduction in head size is a corollary of general reduction. Here, as in general, the explanation of a given head size is an historical matter.

Other criteria of the head and face would be difficult to plot. Face size, in general, is larger among the larger-headed and taller peoples of the northwest, and among those of mongoloid affinity in the east. Most branches of the Mediterranean stock proper are characterized by relatively short and relatively narrow faces. The zone of long heads from Morocco to India is also a zone of small faces. This smallness, however, has as a rule no reference to the nose, which is one of the best racial criteria which we have, and one which is extremely significant. Unfortunately accurate charts cannot be made, since technical discrepancies render the use of statistics based on this organ almost useless in a large compilation.

The nasal index among European peoples is typically leptorrhine or mesorrhine. The southern Mediterranean belt is typified by moderately leptorrhine peoples; and in the eastern extremity, where aquilinity is the

rule, extreme leptorrhiny is very common. The most leptorrhine area in Europe itself is the Dinaric region, particularly Montenegro and northern Albania, where mean nasal indices below 60 are encountered. In most of western Europe the noses are leptorrhine, but when one moves into Russia and the northeastern Balkans, mesorrhiny becomes the predominant form, and nasal indices increase perceptibly as one moves eastward, to a high mesorrhine or even platyrrhine level. Turkish-speaking peoples in the East, however, form an exception to this rule. Turkomans, Azerbaijans, and the like are, as a rule, extremely leptorrhine, more so than the inhabitants of Asia Minor and the Caucasus. On the opposite side of the map, the extreme western fringe of tall, large-headed, meso- to brachycephalic peoples is likewise characterized by a slight increase in the nasal index. The Palaeolithic survivors were not notably leptorrhine; they were, in fact, much less so than the Nordics and others who followed them.

If one were to study the form of the orbits and the shape of the external eye, with adequate data, a very interesting and significant distribution might be seen. For example, the distance between the eyes is relatively great among all of the Slavic and Finnish peoples of eastern Europe, and this dimension increases as one approaches mongoloid territory. It is of moderate size in almost all of northwestern and central Europe, but again becomes pronounced in Ireland, along the coast of Norway, and in the Alpine regions, where one may attribute this wide-eyed condition not to mongoloid influences but again to a Palaeolithic survival.

There are two zones of narrow inter-orbital diameters: (1) the entire Mediterranean zone from the Atlantic to India, and (2) the Dinaric zone reaching from the north of Italy to northern Greece. Again in the so-called Armenoid region of Anatolia and in Armenian territory itself, an extremely narrow inter-orbital distance prevails. This criterion may perhaps survive as a means of discrimination between facially characteristic Palaeolithic survivors and mongoloids, on the one hand, and basic Mediterraneans and Armenoid-Dinarics, on the other.

The size, robusticity, and general form of the lower jaw is again an excellent racial criterion, but there is not enough data to permit it to be plotted. The Mediterranean zone from Morocco to India is characterized by a light, shallow jaw, a narrow bigonial diameter, and a restricted height dimension between the lower dental border and chin. This is the typical Mediterranean mandible, whether one finds it in Spain or in Arabia. The heaviest jaws and greatest bigonial diameters are found in the northwestern European borderlands, and in eastern Europe, where mongoloid influence is strong. The relatively light, narrow jaw of many Dinarics and Armenoids again suggests that these types are for the most part brachycephalized forms of tall Mediterraneans.

(5) DISTRIBUTION OF BODILY CHARACTERS

(c) *Pigmentation, the Pilous System, and Morphology of the Soft Parts*

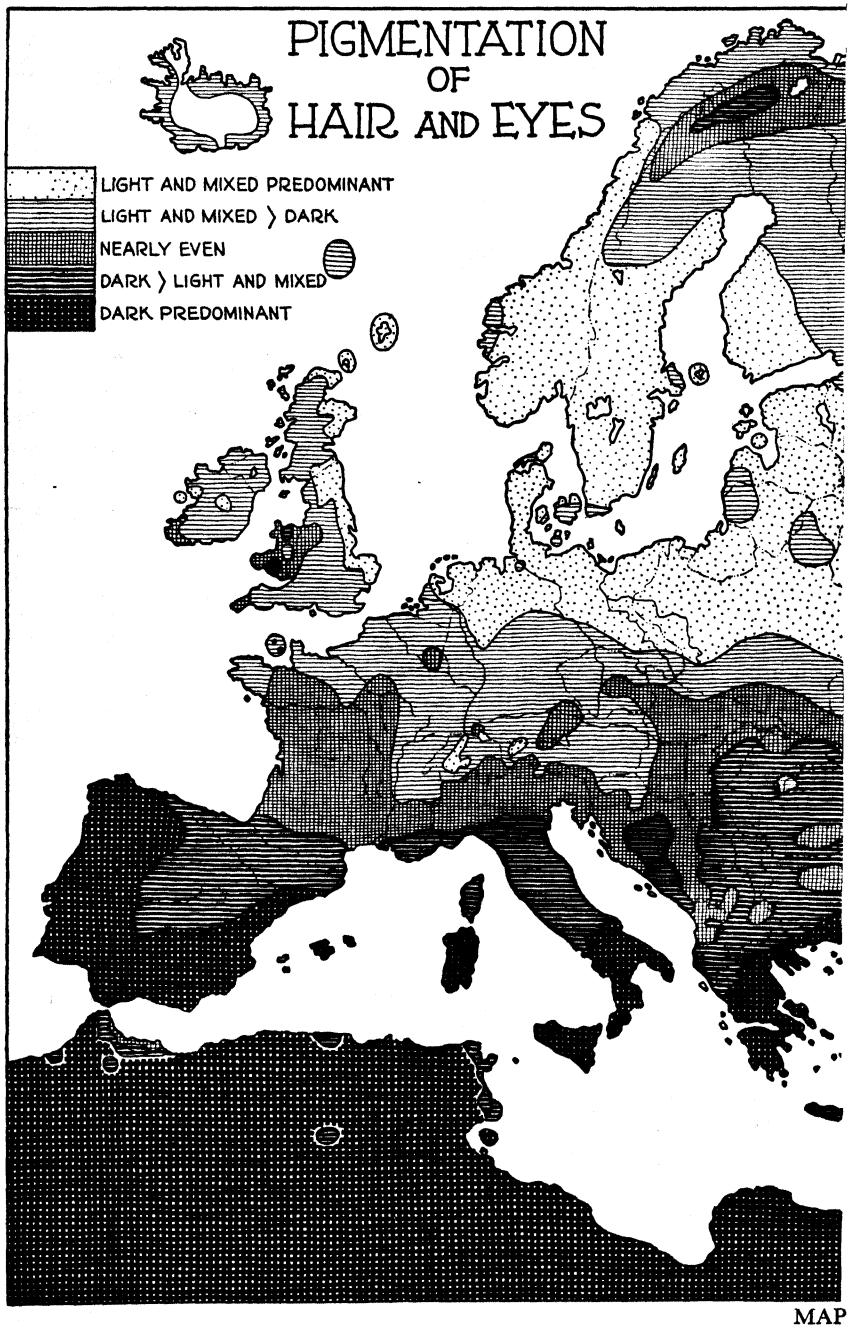
The fourth and last of the general distribution maps (Map 8), is designed to show the distribution of progressive degrees of blondism in the European area. While data on hair and eye color are plentiful, much material has been collected without the use of scales; although it is possible to correlate this with standard material in most major areas, the judgment of the compiler nevertheless plays a greater part here than in the maps which show the distributions of purely metrical characters. Under these circumstances, it has seemed most useful to divide the existing materials into five broad classes, designated and distributed as follows.

The darkest stippling represents populations in which the hair is consistently black or dark brown (distinctions between these two shades are seldom valid), with less than ten per cent of a lighter hue. The accompanying eye color found in this brunet class is pure brown or black in over sixty per cent of the series; in most cases over eighty. Since all brunet white populations studied show some degree of mixed eyes [22] (green, blue, or gray in conjunction with brown), a small minority of this type seems endemic in the white racial stock, and must not be construed as evidence of racial blondism. Skin color, which again is an important element in blondism, varies less among Europeans than do either hair or eye color, and is more difficult to use. Hence it has been omitted from consideration in the draughting of the pigment map.

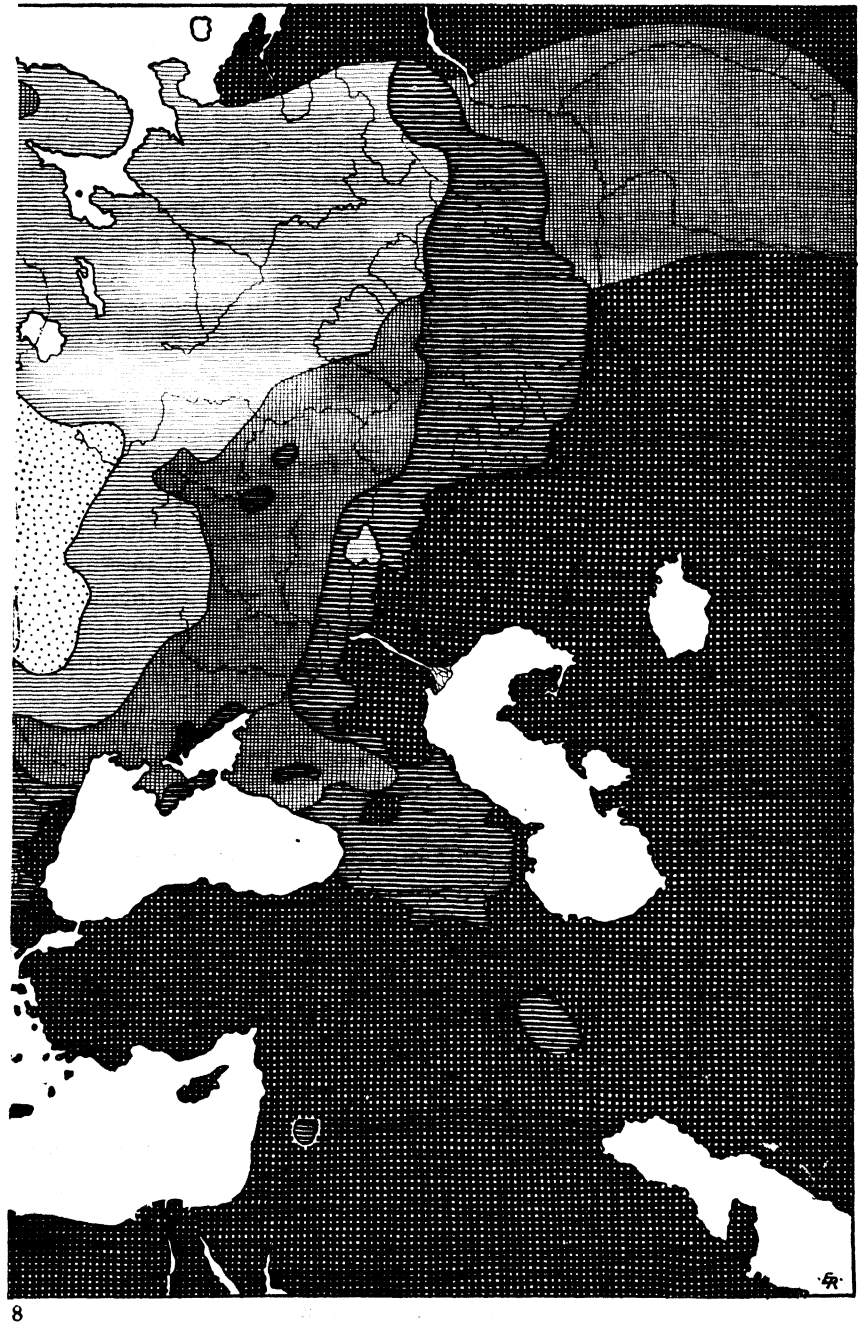
The brunet hair and eye condition defined above, including a minimum of blondism, surrounds Europe and encroaches on all its borders, not excluding the Atlantic. North Africa, almost all of Asia on or off the map, Portugal, most of Spain, southern Italy, Greece, the Aegean fringes, and finally, the northern pastures of the Samoyeds, converge to encircle the world's one important nucleus of blondism.

The second most heavily stippled zone shown on the map, that of prevailingly brunet pigmentation, covers regions in which complete or partial blondism is not rare, but is definitely less common than a purely brunet condition. The width of this zone depends, of course, upon the latitude of the category assumed by the author. In the present map, it is relatively narrow, and includes central and northern Spain, central Italy, most of the Balkans, the Caucasus, and a narrow vertical belt in eastern Russia. The Lapps, in their purest discoverable form, seem to fit into this class rather than the purely brunet one. Islands of prevailingly brunet pigmentation occur far afield from the main zone, in parts of Wales, in

[22] The only valid exceptions seem to be the Ruwalla Bedawin and the Tuareg. See Chapter XI, sections 2 and 12.


PIGMENTATION
OF
HAIR AND EYES
LIGHT AND MIXED PREDOMINANT
LIGHT AND MIXED 〉 DARK
NEARLY EVEN
DARK 〉 LIGHT AND MIXED
DARK PREDOMINANT

MAP



8

Morocco, Algeria, and Tunisia, in Crete, in the Jebel Druz, and in Luristan. The reasons for these exceptions are different in almost each case, and must be treated separately later.

The decision as to the midpoint between blond and brunet hair and eye pigmentation hinges largely on one's definition of pure blondism. For practical purposes, pure eye blondism includes gray and blue eyes, with or without a small number of pigmented spots, or a narrow pigmented ring, near the pupillary border of the iris. It is impossible to segregate the spotted and unspotted in most data. Pure hair blondism includes, in the same arbitrary fashion, hair that ranges from light brown to ashen or golden. In the present map the intermediate class represents regional samples in which light and light mixed forms seem approximately equal to those which are prevailingly brunet.

This intermediate zone is again narrow, and again continues the general scheme of concentricity. An exception to this scheme is seen among the Ostiaks, a Finnish group living along the banks of the Obi River and its western tributaries. Bulgars and Vlachs possess more blondism than a class four stipple would show, but hardly enough for the intermediate class when taken en masse. Therefore three capsules of intermediate stippling in the Balkans indicate these tendencies in a schematic manner. The northernmost and the southwesternmost represent concentrations of Vlachs, the middle one of Bulgars.

Walloons of the province of Luxembourg, and southeastern Bavarian mountaineers, conversely, represent nuclei of intermediate pigmentation in blonder territory. One may postulate without difficulty that the Bavarian nucleus was once continuous with northern Italy through the Tyrol, for many Tyrolese are quite brunet, but the continuity has been broken by the Germanic advance in historic times up the Innthal. The refuge quality of the Austrian as well as of the Swiss Alps is conversely shown by the survival, since this Germanic thrust, of very blond local populations in the Lechthal and in other small, isolated valleys. As for the Walloons of Luxembourg they quite palpably represent a survival of pre-Iron Age brachycephals in their highlands, through the period of Celtic and Frankish invasions.

The greatest difficulty of all in compiling this map lay in making the decision between what was predominantly blond, and what was merely more blond than brunet. If the eyes were almost uniformly light or light mixed, and the hair light brown or lighter in over fifty per cent of cases, the lightest group seemed indicated; if, in a majority of cases, the hair was dark or medium brown, or the eyes mixed, the second class was chosen. Sometimes both hair and eyes indicated the second lightest stipple. In the predominantly blond class, pure brunet pigmentation is less than ten per cent.

The greatest degree of blondism recognized is definitely nuclear and, in fact, almost glacial in its distribution. There is, however, a nucleus within a nucleus; a center of lesser blondism which seems truly hypermarginal. This is the partial blondism of the Danish islands, of parts of the Norwegian coast, of Iceland, and of the southwestern tip of Ireland. This inner nucleus apparently coincides with the survival of the oldest, immediately post-glacial population.

It is not unlikely that the original undifferentiated *sapiens* men, living in the Pleistocene, may have possessed a light brown or brunet white skin color, with black or dark brown hair and brown eyes. Different racial stocks which grew out of this common base by differentiation, mixture, or both, may have shown early tendencies to develop specialized variations of their own in pigmentation. Such tendencies are likewise seen within single species of ape, such as the gibbon, chimpanzee, and gorilla. The negroid races, for example, must have formed, before the end of the Pleistocene, a progressive tendency toward an abundance of dense pigment cells in the skin, the fundus, and the iris; while the whites, before their dispersal from a common center, must already have developed a tendency, presumably recessive, toward blondism. The universality of some degree of blondism among whites and near whites everywhere makes it unlikely that it was ever confined to a single race or group of races within the white family.

Blondism is a state of partial depigmentation, due to the paucity of melanin granules in the skin, hair, and iris, and, with some types of pigment, to the small size of these granules. The pigment granules are composed of a substance known as melanin, the chemical composition of which has been roughly determined.[23] Melanogenesis, the process by which melanin is formed, is "an intercellular enzymic oxidation process, in which an amino acid chromogen is converted, with the aid of catalytic copper, to the pigment melanin." [24] It has been proved by experiments with rats and rabbits that a dietary deficiency in copper produces a pigment reduction,[25] and that with the restoration of a normal diet, the animal's normal pigmentation will return. Hence blondism, being a phenomenon of pigment reduction, is presumably caused by a genetically controlled limitation of the oxidation process dependent upon the body's supply of copper.

[23] Melanin is approximately 55 per cent carbon, 6 per cent hydrogen, 12 per cent nitrogen, 2 per cent sulphur, and 25 per cent oxygen. Young, W. J., **BJ**, vol. 15, 1921, pp. 118 seq.

[24] Glodt, H. R., *Melanogenesis*, a thesis submitted for honors in Anthropology at Harvard University, April, 1937. MS. in Peabody Museum Library, Harvard University. Quotation from p. 71. Author's permission secured. This whole section is taken largely from Glodt.

[25] Cunningham, I. J., **BJ**, vol. 25, 1931, pp. 1267 seq.

Blondism therefore may have originally been motivated as a response to a mineral deficiency through an endocrine agency of control. There is no reason now known why it should be limited to whites, but actually its appearance among members of other major racial groups is rare.

Although skin color is apparently a directly quantitative matter, hair color, it is now known, is determined by two different pigment factors. One is composed of oval or spindle-shaped cells of melanin, of varying size and frequency.[26] When these cells are large and overlap, within the translucent body shaft which lies between the central canal and the outer horny layer of the individual hair, the hair appears black or dark brown. When the cells are smaller they appear yellowish or light brownish, although the chemical composition of the melanin is the same. The size of these cells, therefore, and their abundance within the hair cortex, determine the degree of blondism or brunet coloring.

The second pigment factor which influences hair color is rufosity. Red hair contains a fine stain, at first considered amorphous, which is now thought to be composed of extremely fine cells, probably slightly different in molecular structure from ordinary melanin.[27] This stain may be present or absent, and if present may be faint or intensive. Thus it is both qualitative and quantitative in reference to ultimate hair color. If it coincides with large, dark melanin cells, the black color so caused may mask the rufosity in all but unusual lights, while if a large amount of it coincides with blondism, red hair is the result. It is likely that golden hair is caused by a combination of blondism with a slight degree of rufosity.

If one could test for rufosity accurately with all pigment shades, it would probably be seen that this character has no association whatever with blondism, but is a purely independent variable. That this is likely is shown by the fact that rufosity is completely uncorrelated with eye color.[28] Thus rufosity may be wholly absent in many normal individuals, while the melanin cells are totally absent only in albinos. Rufosity may, by the same token, be lacking in entire races, and with better data it might be possible to discover the racial significance, if any, of this apparently functionless condition. Within the blonder segment of the white

[26] Conitzer, H., **ZFMA**, vol. 29, 1931, pp. 83–147.
Hausman, L. A., **AJPA**, vol. 12, 1928, pp. 276–277.
Jankowsky, W., **ZFRP**, vol. 5, 1932, pp. 1–48, 111–119; also **VGPA**, vol. 6, 1931–32, pp. 66–69.

[27] Conitzer, H., *op. cit.*
Klinke, K., **BZB**, vol. 160, 1925, pp. 28 seq.

[28] Conitzer, H., *op. cit.*
I have separately confirmed this claim by making 130 contingency tables, of six or more boxes, between hair and eye color, in each of which a negotiable amount of rufosity was present. In every instance red hair was found to be completely complacent to eye color.

race, however, we know that rufosity has a regional and a racial connotation. Blond hair is readily divisible into two categories, golden and ash-blond (cendré), which are distinguished on the Fischer hair color chart. Light brown and brown hair shades similarly may be segregated on the same basis into two separate and parallel classes.

The pigmentation of the iris is more suited for refined analytical study than either skin or hair color. Skin tans and weathers, while hair bleaches with the sun and darkens with advancing age, until the advent of graying; the iris, on the other hand, retains its pigment pattern with relatively little change. If studied under constant light conditions, so that the pupil is contracted and the concentric muscle zones flattened, the iris is seen to be a detailed field of muscle-layers and pigment cells, of considerable complexity.

In all but albinotic eyes, the inner wall of the iris is permeated with melanotic pigment cells so overlapped as to make the iris, whether dilated or contracted, a perfect light-proof diaphragm. It is this pigment lining, reflected through several layers of outer iridical tissue, that gives a light eye its blue appearance. Additional pigment presents its true brown color. Thus in a mixed eye of complex pattern it is possible to plot the relative depths of different groups of pigment cells. Cells concentrated along the radial, dilating muscle fibers give the eye a rayed appearance, while those lumped about the concentric sphincters produce a zoning. In a black eye the surface pigment is so dense that it is impossible to see into the iris, but in a brown eye it is usually possible to make out some of the pattern. Many purely brunet eyes show a contrast between different brown-producing layers.

In purely light eyes, in which no surface pigment is seen, there are nevertheless differences in coloring which are readily noticeable and which may be used as criteria of racial differentiation. The principal distinction is that between the blue eye, which in its extreme form takes a deep sky-blue color, and the gray eye, which in its extreme form is almost white. Since these two forms grade into each other without a natural line of demarcation, the factor which distinguishes them must be considered quantitative rather than qualitative. Research on this subject does not seem as yet to have been done; we do not know what causes this difference, and can only repeat Bryn's speculation that it has something to do with the relative coarseness and opacity of the radial iris muscles, through which the pigment in the posterior walls of the iris is reflected.[29]

Geographically and in individuals, it is possible to make valid correlations between the four end types of hair and of eye blondism. The golden type of hair, whether blond or brown, tends to be associated with the

[29] Bryn, H., *Homo Caesius*, p. 19.

bluer shades of eye, whether pure light or mixed; on the other hand, the ash blond type of hair usually goes with a grayish iris. At present there seems to be no direct reason for these linkages, but we have much to learn about these matters.

At any rate, when we apply this distinction to the map, we see that the golden-blue combination is commonest in the western half of our nuclear zone of light pigmentation, in Norway and the British Isles; while the ashen-gray combination is more typical of Sweden and of the lands east of the Baltic. In the western half of the blond nucleus, and especially in its British periphery, there is an asymmetry of linkage, for in Ireland, for example, a world's extreme ratio of light eyes is associated with hair which is often brown or dark brown. On the eastern side the opposite is true; in Poland and southern Russia ashen hair of a very light shade goes frequently with dark-mixed or brown eyes. These regional asymmetries weaken the total unity of blondism, but do not destroy it.

From further correlations between types of pigmentation and other characters, such as stature, bodily build, head size, head form, and face form, it is possible to show that the golden-blue variety, with rufosity, is partly associated with the old Palaeolithic hunting strain, while the ashen-gray extreme goes rather with the Iron Age Nordic range of types, and with eastern European blonds of various degrees of superficial mongolism. Within historic times the zone of frequent blondism stretched from north western Europe across the Russian steppes into central Asia where it touched China, but violent and rapid ethnic movements in Asia have nearly eliminated this eastern extension. We do not know how long ago the distribution map of blondism assumed its present concentric and glaciation-like character.

It is very probable that pigmentation is definitely capable of alteration in response to environment, through selection. Blonds in the tropics are at a disadvantage, particularly if living under primitive cultural conditions. A black skin with a profusion of sweat glands, like that of the African negro, must be better than a pinkish integument which is subjected to repeated burning and blistering, and incapable of tanning.[30] In the iris, the pigment in the posterior wall acts as a completely light-proof diaphragm, and hence there can be no direct functional disadvantage to a gray or blue iris, as with that of an albino. But since the iris color seems to be, as Wilmer has shown,[31] correlated with the pigmentation of the retina, eye blondism may serve to indicate the presence of a functional disadvantage. It is conceivable, but not as yet demonstrable, that the chocolate-brown pigment cells in the negro's fundus may give his optic nerve more comfort in the desert glare than the pinkish, almost pigmentless retina of the blond white man.

[30] Baur, E., Fischer, E., and Lenz, E., *Human Heredity*, p. 154.
[31] Wilmer, W. H., *Atlas Fundus Oculi*.

Black skin and a black eye, then, may be variables which are advantageous under hot, bright, equatorial light conditions. A partially depigmented skin and fundus condition can perhaps survive without disadvantage only in a climate where the light is weak. Blond hair, however, cannot be assigned any survival value of either a negative or a positive character. Until definite experimental evidence is at hand, we must postulate that only through its partial genetic linkage with skin and eye color is the blondism or darkness of hair determined. On the whole, the totality of evidence in regard to blondism as a unit indicates that this phenomenon is a recessive trait endemic in the white racial stock, and that it has become a major racial character only among groups of people living at one time under light conditions of sub-glacial intensity. This applies to the Upper Palaeolithic strain in part or as a whole, and to certain of the more northerly Mediterranean branches. The mongoloids and American Indians living under parallel conditions apparently lack the initial mutative tendency necessary for its development.

In the European zone of maximum blondism are included tall and short populations, long-headed and round-headed, eagle-beaked and snub-nosed; many such variations occur to which degree of pigmentation seems complacent. Within the two main types of blondism, racial sortings are clearer, but on the whole blondism alone assumes the character of an unlinked mutant.

Without actual maps, there is little use in reviewing the distribution of the pilous system and soft parts, in more than a cursory manner, since these will be discussed at greater length in the chapters to follow. Hair form, which according to Haddon is the most important racial criterion to be found in man, is of little use in distinguishing white sub-groups. Most European hair is straight or slightly wavy, although exceptional individuals in the straightest-haired groups have ringlet forms. Curly hair of this description is quite common in western Ireland and in Wales; it is also frequent in the whole of North Africa and in the western Mediterranean shorelands of Europe. Eastern Europe is predominantly straight haired, and as one approaches mongoloid territory this condition of course becomes more pronounced.

The amount of body hair on the adult male is closely correlated with the amount of beard, and both are linked with age, for a hairy man grows hairier as he becomes older. At the same time, baldness is most frequent among those with heaviest body hair and heaviest beards. Browridges, and other bony excrescences of a hypermasculine nature, are closely linked with excessive pilous development of the body and beard, and with a tendency to baldness. Europeans, on the whole, are among the hairiest-bodied and heaviest-bearded groups of men, being equalled or exceeded

only by the Australians and the Ainu. Both negroid and mongoloid skin conditions are inimical to excessive hair development except upon the scalp.

The Mediterranean peoples, on the whole, are less hairy than other Europeans. Pure dolichocephalic Europeans, of normal Mediterranean type, whether blond or brunet, tend to a hairless chest and a patchy beard. Among Arabs a complete beard is rare, and is considered a sign of evil character. One must look upon great hairiness, and a great beard development, as well as a high incidence of baldness, as a multiple endocrine manifestation associated with relatively great sex differentiation in a masculine direction. Alpines and Central Europeans, in general, show an excess of this combination, and so do many Balkan peoples and Near Eastern Asiatics. This combination is in Europe associated with the non-Mediterranean element in the composition of the white stock, although in Asia the cleavage is not so clear. The baldness which is part of this complex is of genetic motivation, and differs in cause from the dry-scalped, fine-haired alopecia associated with extreme hair blondism.

The morphology of the external eye is also subject to regional distribution. High orbits, with no folds, are characteristic of Dinarics, and of most Near Eastern peoples; orbits of moderate height, and with a tendency to external folding in maturity and old age, go with long-headed peoples of both blond and brunet varieties, while a median fold, indicative of both a low orbit and a thick fat deposit in the eye region, goes rather with the Finnic and Slavic blond mesocephals and brachycephals. The true internal or mongoloid fold is not common in Europe and is found in numbers only in the east, in the Kalmuck and Tatar districts of Russia, and in the far north.

Extreme cragginess and ruggedness of facial features, including the forehead, the superciliary region, the malars, the jaws, and the nose, are associated with the western marginal fringe area, and especially with the region of largest heads and maximum Palaeolithic survival. Nordics and Mediterraneans, whether in Europe, North Africa, or southwestern Asia, have a maximum of facial relief, without this appearance of bony massiveness. The malars are laterally compressed, the nose thin and often beaked. Facial flatness, intensified by fatty deposits over the malars, while more typical of mongoloids, becomes characteristic in eastern Europe and extends into Poland, Finland, and Hungary.

The maximum nasality of the Near Eastern peoples, of whatever head form, is accompanied by a number of related features. One of these is the concurrency of the eyebrows over the nose, which is geographically centered in the Near East. Another is the predominant convexity of the nose as a whole, and the depression of the tip, especially in old age. In man the

nose passes through a definite and continuous cycle of growth changes comparable in form, if not in degree nor in exact anatomical detail, to those found in the proboscis monkey. The nearest approach to the proboscis in the extent of nasal change is, however, found among Near Easterners from Armenia to Afghanistan. In Europe the same is true to a lesser degree in Albania and Montenegro.

A map showing the form of the nasal profile would have centers of convexity in the Dinaric area and throughout western Asia, with the exception of Arabia; centers of concavity would lie in the north of Scandinavia, and across the whole of eastern Europe from the Baltic onward. The rest of the map would be relatively undifferentiated, with all forms present, but the straight profile most common.

(6) RACIAL CLASSIFICATION WITHIN THE WHITE FAMILY

We have reviewed some of the characters upon which race, in the sense of sub-divisions of the so-called white branch of living humanity, may be classified. It has become apparent from this review, as from the earlier chapters, that the "white" racial family is a composite amalgamation of peoples thrown together by accident of geography, blended into some semblance of homogeneity in major diagnostic features, and altered by environmental and cultural circumstances and by migration. Before attempting to propose a classification of living whites, however, it may be wise to pass in brief review the more important or more influential theories by which race has been classified in the past. The history of racial classification is a subject for a book in itself, and here we propose to limit our discussion to its minimum.

It is impossible to say when man began to classify himself into races. Knowledge of racial differences must, however, be as old as these differences, and must from the beginning have been a factor in their development. The Egyptians were well aware of the racial problem, and took pains, in their art, to differentiate between the various kinds of men that they knew. The Greeks likewise made classifications; both Hippocrates and Aristotle were strong environmentalists, as were the mediaeval Arab geographers who followed the classical tradition. Since these ancients and mediaevals wrote before the discovery of the bell-shaped curve (normal probability curve), probable error, correlation, or of the cephalic index, their system of classification was both observational and intuitive, and operated by the mechanism of generalization. Despite the work of the biometricians, and the mechanization of physical anthropology during the last half century, all important or influential systems of classification yet devised still operate on the same principle. .

Aside from the ancients and their mediaeval followers, the modern

period in physical anthropology begins with Blumenbach, whose system is still employed by most grade school geographers. Blumenbach, some one hundred and fifty years ago, divided mankind into the familiar white, black, brown, yellow, and red races, basing his primary classification upon skin color, although he considered other characters as well. In breadth of popular acceptance, his is still, in its simplest form, the most influential classification. During the first half of the nineteenth century, the world of science as well as the public was inclined to accept Blumenbach's divisions without too much protest, but in the period from 1860 to 1890, Europe was rife with attempts to classify mankind into orderly systems.[32]

In 1878 Topinard proposed a classification based not on skin color, but on hair form.[33] Haeckel [34] and Müller [35] proposed the same diagnostic one year later. Topinard did not, however, rely on one character alone, but included skin color and nose form as subsidiary diagnostics. During this general period of activity systems were proposed by such varied authorities as Huxley, Geoffrey de St. Hilaire, and de Quatrefages;[36] it was the last named, who, during the war of 1870, first prostituted the materials of physical anthropology for the purposes of nationalistic propaganda. The gauntlet flung down by de Quatrefages, who called the Germans "Huns," was seized by his enemy and converted into the more effective weapon of Nordicism.

It remained for another Frenchman, however, to coin the word "Nordic." This was Deniker,[37] who has had a greater influence upon the subsequent classification of race than any of his nineteenth century contemporaries, and who still remains the most important classifier. In view of the lack of scientific method available at his time—his classification, later modified slightly, was first published in 1889—his intuitive genius and his grasp of patent situations were extraordinary. Born in Russia and educated in St. Petersburg as an engineer, he had travelled widely throughout eastern Europe and the Caucasus before he settled in Paris in 1876, at the age of twenty-four, to begin his career as an anthropologist.

The first step in Deniker's system was to divide mankind on the basis of a combination of hair form, hair and eye color, and nose form, with hair form as the principal diagnostic. He made six primary divisions, as shown on page 281.

[32] Deniker, J., *The Races of Man*, pp. 280–284.
[33] Topinard, P., **RDAP**, second series, vol. 1, p. 509, 1878, etc.
[34] Haeckel, E. H., *Natürliche Schöpfungsgeschichte*, vol. 7, pp. 626, 647.
[35] Müller, Fr., *Allgemeine Ethnographie*, pp. 17–19.
[36] Deniker, J., *loc. cit.*
[37] Deniker, J., **BSAP**, vol. 12, 1899, p. 320; **JRAI**, vol. 34, 1904, pp. 181–206; *The Races of Man*, pp. 285–286.

A. Woolly Hair, Broad Nose.
B. Curly or Wavy Hair.
C. Wavy Brown or Black Hair, Dark Eyes.
D. Fair, Wavy or Straight Hair, Light Eyes.
E. Straight or Wavy Hair, Dark, Black Eyes.
F. Straight Hair.

Within these primary divisions he based his further classification upon combinations of skin color, nose form, stature, cephalic index, pilous development, browridges, and other characters. By this means he properly separated the Bushman into a separate class of group A; the Australian as well as the Dravidian went into group B, and were thus separated from a major "black race." Within the straight-haired class the Lapps, Mongoloids, and American Indians were arranged into what seemed then a reasonable order.

The white group, with which alone we are concerned, falls almost entirely into his C and D categories, with one segment in B. The table on page 282 gives this section of his classification in full.[38]

In that table, Deniker lists a number of races found both in Europe and outside that continent, of which eleven, not counting the Ainu, might be classified as basically white. His #5, the Ethiopian, is the Hamitic race of East Africa, with or without a slight negroid increment; his #9, the Indo-Afghan, is the hook-nosed type of Mediterranean which we have found to extend from Mesopotamia to India across the highland belt, from at least the third millennium B.C. onward; his #8 is Armenoid. The inclusion of the Ethiopian and Assyrioid with Australians and Dravidians rather than with whites, while inexact, points, in the first case, to the negroid admixture of modern Ethiopians, and in the second, to a realization of the affinities of Australoids and Veddoids to the white group as a whole.

Besides these three, in effect, Hamitic, Armenoid, and Irano-Afghan, he finds two other white races outside the continent of Europe proper: these are his Arab and Berber. Thus we find a total of five morphologically white races in Asia and Africa; four of these are actually sub-divisions of the cranially unaltered basic Mediterranean stock.

In Europe itself he finds six races; the Littoral European, also called Atlanto-Mediterranean, is the tall Mediterranean associated in antiquity with Megalithic cultures, and may be related basically to Deniker's Ethiopian. His Ibero-Insular is the short Mediterranean race of Spain and the western islands, and corresponds to the Neolithic Mediterranean type in these regions. Deniker distinguished, therefore, between certain

[38] Based upon Deniker's 1912 classification with some reference to his 1889 scheme as well.

B. CURLY OR WAVY HAIR

1. DARK SKIN	Reddish-brown, narrow nose, tall stature, dolichocephalic.	Ethiopian	5
	Chocolate-brown, broad nose, medium stature, dolichocephalic.	Australian	6
	Brownish-black, broad or narrow nose, short stature, dolichocephalic.	Dravidian (sub-races Platyrrhine and Leptorrhine)	7
2. SKIN OF	tawny white, nose narrow, hooked, with thick top, brachycephalic.	Assyrioid	8

C. WAVY BROWN OR BLACK HAIR, DARK EYES

1. SKIN	clear brown, black hair, narrow, straight or convex nose, tall stature, dolichocephalic.			Indo-Afghan	9
2. SKIN TAWNY	Tall stature, elongated face	Aquiline nose, prominent occiput, dolichocephalic, elliptical form of face.		Arab or Semite	10
		Straight, coarse nose, dolichocephalic, square face.		Berber (4 sub-races)	11
WHITE, BLACK		Straight, fine nose, mesocephalic, oval face.		Littoral European (Atlanto-Mediterranean)	12
HAIR	Short stature, dolichocephalic			Ibero-Insular	13
3. SKIN DULL WHITE, BROWN HAIR	Short stature, strongly brachycephalic, round face.			Western European	14
	Tall stature, brachycephalic, elongated face.			Adriatic (Dinaric)	15

D. FAIR, WAVY, OR STRAIGHT HAIR, LIGHT EYES

SKIN REDDISH	Somewhat wavy, reddish, tall stature, dolichocephalic.	Nordic	16
WHITE, HAIR FLAXEN	Somewhat straight, flaxen haired, short stature, sub-brachycephalic.	Eastern European (*R. Orientale*)	17

E. STRAIGHT OR WAVY HAIR, DARK, BLACK EYES

SKIN LIGHT BROWN,	very hairy body, broad and concave nose, dolichocephalic.	Ainu	18

of the basic sub-varieties of the Mediterranean family, and except for the categories Arab and Berber, this distinction is on the whole accurate. He was aware of the differences between the three most important surviving divisions; (a) Short Mediterranean, (b) Tall, Megalithic, and East African variety, and (c) Hook-nosed, Indo-Afghan or Irano-Afghan variety.

At the same time, he was aware of the distinction between the Alpines and Dinarics, both in form and in geographical distribution. In his placing of the blonds into a separate category, he was following a taxonomic system rather than an estimate of relationships. His Nordics are accurately defined on the basis of living peoples; they are given a cephalic index of 77 to 79, instead of a non-existent lower mean; and they are segregated from the blond brachycephals of central and eastern Europe.

In order to accommodate other racial elements not fully covered by these classes, Deniker devised certain sub-races: (1) The Northwestern sub-race, a division of the Atlanto-Mediterranean, to accommodate especially the dark-haired western Irish. (2) A Sub-Nordic, which differs from the Nordic in the possession of mesocephaly, a square face, and a turned-up nose; this was devised to accommodate peoples living to the east of the Baltic and in northern Germany. (3) The Vistulan race is a branch of the eastern European or *Oriental.* The *Oriental* is described as short statured (163–164 cm.); moderately brachycephalic (C.I. = 82–83); and possessing light yellow or flaxen hair, a square cut face, a nose which is frequently turned up, and blue or gray eyes. This race is associated with the eastern Slavs and Finns for the most part, while the Vistulan is a variety of the same race with shorter stature and mesocephaly. The last of Deniker's secondary races is the Sub-Adriatic, described as a slightly shorter, slightly less brachycephalic and blonder variety of Dinaric, with a stature of 166 cm., a C. I. of 82–85; and derived from a blend of Dinaric with Sub-Nordic.

Two other authorities of what might be called the prestatistical school deserve mention at this point—Sergi and Ripley. Sergi,[39] whose main interest was the Mediterranean race, based his classification primarily upon the circumferential profile of the head when seen from above, and worked more with crania than with the living. His chief contribution was the realization of the basic unity of the Mediterranean race, in both its blond and brunet forms, and its connection with the bearers of European civilization. Thus he anticipated the findings of the archaeologists that the Neolithic economy was brought into the western world by Mediterraneans.

He also made it clear that the so-called Brown Race, in its dolichocephalic and leptorrhine or mesorrhine forms, was for the most part an

[39] Sergi, G., *Specie e varieta umane; L'Uomo; Le Origini Umane; The Mediterranean Race.*

extension of the same Mediterranean family into southern Asia. He divided whites into Eurafricans, which is another word for basic Mediterraneans, and Eurasiatics, under which he included all brachycephals of white affinity. Sergi anticipated the discovery not only of the unity and cultural importance of the Mediterraneans, but also the dual origin of the white race.

If the schoolchildren and the unerudite public at large still follow Blumenbach, and the anthropologists themselves devise classificatory schemes based upon Deniker, the large intermediate group of educated laymen rely almost entirely upon Ripley.[40] Ripley, writing in 1899, was aware of Deniker's work, but rejected it. He considered that Deniker had made the picture much too complicated, and that there were but three white races, the Teutonic (Nordic), the Alpine, and the Mediterranean. The Nordic and Mediterranean were old European branches of an earlier white stock, while the Alpines were immigrants from Asia who had brought agriculture and the whole Neolithic economy with them. The Alpines, besides introducing a new physical type, parted the Nordics from the Mediterraneans geographically, so that the two might develop separately, and that the Nordics in particular might derive their tall stature and blondism from environmental causes in isolation.

The above brief exposition has many advantages. It is simple, it is lucid, it is easily remembered. It fitted into the linguistic picture of Aryan culture bearers plodding across Europe from their simple home in the Hindu-Kush, developed by nineteenth century philologists, although Ripley himself was vehement in his rejection of linguistics as a proper approach to racial study. At the same time it explained the newly-found and well-preserved Neolithic remains of the Swiss lake dwellings.

With such a simple scheme, it was easy for Ripley's followers to tack psychological characters to the three-fold framework, and the "Nordic with a genius for leadership and government," "the stolid, unimaginative, plodding but virtuous Alpine," and the "gay, artistic, and sexy Mediterranean" soon followed. Hilaire Belloc's famous verses, published originally in the *New Statesman*, satirize this attitude perfectly.

"Behold, my child, the Nordic man,
And be as like him as you can:
His legs are long—his mind is slow
His hair is lank and made of tow.

"And here we have the Alpine race.
Oh! what a broad and brutal face.
His skin is of a dirty yellow
He is a most unpleasant fellow.

[40] Ripley, W. Z., *The Races of Europe.*

"The most degraded of them all
Mediterranean we call.
His hair is crisp and even curls
And he is saucy with the girls."

Ripley himself had little or nothing, in a direct sense, to do with this efflorescence of speculative psychology, for the attitude of differential racial values had been crystallized as early as Gobineau; [41] but he did give the exponents of this school a facile terminology. Racial nationalism had been growing before Ripley's time; but he, for the first time, gave the laymen a racial classification which they could understand, and which could be converted into catchwords.

Like his predecessors, Ripley was discreet about the age of white men on European soil; only in the case of the Alpines was he willing to set a culturally stabilized date. In his day it was generally believed that the Neolithic went back to anywhere from eight to fourteen thousand B.C., and the Mesolithic period was not generally recognized. Furthermore the function of the glacier in regard to human habitat was but poorly comprehended. Ripley did, however, make one speculation about the survival of preglacial man in Europe; he postulated that some of the inhabitants of the Dordogne region in France might be Crô-Magnon descendants.

Some twenty years previously Verneau [42] had remarked upon the resemblance between Guanche crania from the Canary Islands and these Crô-Magnon skulls, and had postulated a genetic relationship between the two peoples so separated in space and in time. In 1896 von Luschan and Meyer [43] reaffirmed this relationship, and this endorsement prepared the way for a more accurate realization of the part played by survivors from the last glacial period in the modern peopling of Europe. It was soon realized that, if Upper Palaeolithic man could survive in the Canary Islands, he could persist elsewhere as well, and from this start arose the theory that the Crô-Magnon people had retreated northward with the glacier, and had survived in Scandinavia. Paudler,[44] in his *Die hellfarbigen Rassen*, first put this thesis into digestible form, and distinguished between his "Dalo-Nordic" or "Fälish" (Günther), which is tall, long-headed, with a mesorrhine nose and short, broad face, and a "Teuto-Nordic" which is also tall and long headed, but has a long, narrow nose

[41] Gobineau, A. de, *Essai sur l'inégalité des races humaines.*

[42] Verneau, R., **BMSA**, Paris, ser. 2, vol. 2, 1876, pp. 408–417; *Arch des Missions Scientifiques et Litteraires*, Paris, 1887, ser. 3, vol. 13, pp. 567–817.

[43] Meyer, H., *Die Insel Teneriffe; Über die Urbewohner der Canarischen Inseln.*
Luschan, F. von, article in Meyer, *Teneriffe.*

[44] Paudler, F., *Die hellfarbigen Rassen.* See also his earlier article in *Anthropos*, vols. 12–13, 1917–18, pp. 641–694.

and face form. The first is considered to be the primary Crô-Magnon descendant.

From this thesis has arisen the idea, in conjunction with philology and archaeology, that the Germanic peoples, as descendants of Crô-Magnon, represent the racial and linguistic nucleus of the Indo-Europeans; that European Neolithic civilization and Indo-European speech both had their origin in northern Germany and Scandinavia; that the Corded people, a Nordic variety, originated and spread from here; and that in effect, the Nordic race, Indo-European speech, and European culture in its basic form, arose from Palaeolithic racial and cultural origins in this northwestern European glacial center. This theory, bolstered on the archaeological side by Kossinna,[45] is popular in Germany, but is by no means endorsed by all German physical anthropologists.

The modern German school has made a great advance over Deniker and his contemporaries, and over Ripley, in the realization that an important element in the modern European racial conglomerate is of glacial antiquity in Europe. The difference between their conclusions and those of the present study lies mainly in my acceptance of Childe's derivation of the Neolithic economy, and Menghin's as well, rather than that of Kossinna. Von Eickstedt,[46] the most articulate of the modern German raciologists, in his derivation of European peoples from Asia at various periods, does not emphasize the introduction of the food-producing economy in this connection.

It would be outside the scope of the present study to attempt a complete survey of current ideas and current classifications which concern the European races. A partial survey would, on the other hand, be unfair to those who might, through limitations of space, be neglected. I shall, therefore, limit my exposition to the systems of two authors,[47] von Eickstedt and Czekanowski, who have been particularly occupied with the question of racial taxonomy and who are the most vocal members of the German and Polish bodies respectively. Their influence has been considerable, and their schemes are articulate and orderly.

Von Eickstedt, whose *Rassenkunde und Rassengeschichte der Menschheit* represents the most ambitious attempt at world-classification yet made, follows, in his European sections, three masters: Ripley, Deniker, and Montandon. It is the combination of these three, skilfully blended, which has produced his system. In the first place, he agrees with Ripley that there are but three basic races in Europe; Nordic, Alpine, and Mediterranean. These three are typically confined to three climatic and

[45] Kossinna, G., *Ursprung und Verbreitung der Germanen*, **MannusB**, #6a, 1928.

[46] Eickstedt, E. von, *Rassenkunde und Rassengeschichte der Menschheit.*

[47] I am omitting Günther, despite his great vogue, since his system is a close Germanization of Deniker's, with a few changes.

geographical zones; the cold northern plain, the central mountain belt, and the warm belt reaching along the Mediterranean shores, and over Arabia and Iran to India.

He differs from Ripley, however, in that he divides his three zones into sub-races, and here he follows, for the most part, Deniker. The northern zone is occupied, at its western extremity, by the Nordics; at its eastern by his *Osteuropid* race, the *Orientale* of Deniker, and the *East Baltic* of Nordenstreng and of authors writing in English.[48] The central mountain belt is occupied, reading from west to east, by the Alpines, the Dinarics, and, in Asia, the Armenoids, and the *Turanids*, the latter being the leptorrhine brachycephalic central Asiatic Turkish racial form. The southern zone is occupied by the Mediterraneans on the west, then the *Orientalids* (Deniker's Indo-Afghan) in North Africa, and thence over to Khyber Pass, where the *Indid* race begins.

In the differentiation between the segments of each zone, Montandon's ideas,[49] elaborated from those of Rosa, come into play. Von Eickstedt, following the principles of the ologenesis theory, has decided that some races are *progressive* in the evolutionary sense, while others are *primitive*. The two words, here simply Anglicized from the German, are apparently translations of Montandon's *precoce* and *tardif*. The distinction is that one is capable of further evolution, the other is not. In the von Eickstedt sense, the primitive branch is usually earlier. Thus he makes the Alpines, in particular, primitive; the Dinarics, in contrast, are progressive forms of the same original root.

According to von Eickstedt, the races which come under his classification entered Europe in post-glacial times. First came the Mediterraneans, during the Mesolithic; then the Alpines, who approached the Swiss lake dwellings from the east, but still in Mesolithic times; the Dinarics go back only to the Bronze Age. The Alpines were a forest people, and spread out into the forests of northern Europe as well as of those which covered the mountains in the center. An extra-primitive proto-Alpine type went to Denmark to associate itself with the Maglemose culture. Then the Nordics broke through along the newly-formed northern steppes, and entered Scandinavia over Denmark, passing into Norway by two routes: around by Oslo; and through the gap between the two melting nuclei of the glacier, into Trondelagen. Earlier brachycephals are found at the termini of these routes.

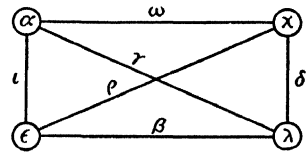
According to his system the Lapps are Alpines isolated in the north; they are the purest Alpines of all and are not mongoloid. The Nordics

[48] Nordenstreng, R., *Europas Människoraser och Folkslag.*
Lundborg and Linders, *Racial Characters of the Swedish Nation*, pp. 50–52.
Hooton, E. A., *Up from the Ape*, pp. 508–509, 535.

[49] Montandon, G., *La Race, Les Races.*

are divided into three sub-divisions: Teuto-Nordic, the original and basic form; the Dalo-Nordic, which is the same plus Crô-Magnon mixture; and a Fenno-Nordic, reddish haired and water-blue eyed, which is the eastern-most, largely Asiatic branch, now found only in solution. The *Osteuropids* are a separate race, a Nordic-Mongoloid transitional form, dating from the time of differentiation between these two stocks; and not a Nordic Mongoloid mixture, since its superior blondism and possession of distinctive traits make its mixed derivation impossible. This race developed in the swamps and forests of the Obi drainage, and entered Europe only in modern times; its penetration of eastern and central Europe is a recent phenomenon.

So much for von Eickstedt's classification. It fits with some fidelity the facts of racial distribution in Europe, but it does not fit all of the facts of history. In this respect we may apply the same criticism to the system of Czekanowski, which is illustrated by the diagram below: [50]



According to Czekanowski, there are four basic white races, located schematically at the corners of the square; and six sub-races or mixed types, which result from the crossing of the four fundamental ones. These races and sub-races, with their Greek letters, may be listed as follows:

		Pure Races	
alpha	=	Nordic	
epsilon	=	Ibero-Insular	
lambda	=	Lapponoid	
chi	=	Armenoid	
		Mixed Types	
iota	=	Northwestern	(alpha—epsilon)
gamma	=	Subnordic	(alpha—lambda)
omega	=	Alpine	(alpha—chi)
rho	=	Littoral	(epsilon—chi)
beta	=	Pile Dwelling	(epsilon—lambda)
delta	=	Dinaric	(lambda—chi)

This scheme is obviously an attempt to place Deniker's system in a mathematically orderly form. Czekanowski defines his Lapponoid in

[50] Czekanowski, Jan, **AAnz**, vol. 5, 1928, pp. 335–359; **AASF**, ser. A, vol. 25, #2, 1925.

such a way as to include the Alpine of Ripley, as well as the Lapps proper. In this identification of Lapps and Alpines, Czekanowski and von Eickstedt agree. The Dinaric becomes a mixture of Lapponoid and Armenoid, which is difficult to follow; the "Pile Dwelling," being a mixture of Lapponoid and Mediterranean is, however, fully in accordance with the facts in regard to the crania of Swiss Lake Dwellers,[51] concerning which Czekanowski is a specialized authority.[52] It seems unfortunate that the word "Alpine," should be torn from its context, immortalized by Ripley, and applied to a hypothetical Nordic-Armenoid cross, thus further abetting the confusion prevalent among even professional anthropologists, a confusion which Günther, in his wholesale swapping of names, has done much to foster.[53]

It is not the purpose of the present survey to criticize in detail the two schemes chosen for presentation. Czekanowski, like Günther, von Eickstedt, and others, has rescued the Armenoid, which was first carefully described by von Luschan,[54] from the obscure companionship of Australians and Ethiopians in which Deniker had thrown it; he also, anticipating von Eickstedt and following the early example of Pruner Bey,[55] has attempted to salvage the Lapps from a mongoloid category and to make them full-fledged if primitive Europeans. But his scheme is manifestly too pat, too regular, and too mathematical, to agree fully with nature, and, furthermore, it disagrees in many respects with the findings of the historical discipline.

In making our own classification, let us first review the system which grew out of the skeletal study in Chapters II to VII. The groundwork of this system, and the list of types, may be gathered from the study of the lower half of Fig. 30. In this chart an attempt is made to separate the purely *sapiens* Mediterranean group from the Upper Palaeolithic mixed *sapiens* and Neanderthal races. Thus the Mediterranean sub-groups, races of food-producers which had already become differentiated before the great migrations into Europe, are listed as follows: Irano-Afghan, Corded, Atlanto-Mediterranean, Cappadocian, Mediterranean Proper, and Danubian. The old hunting and fishing population is divided into: Brünn, Borreby, and Alpine; while that branch which bears a considerable strain of incipient mongoloidism, includes Lappish and Ladogan, the latter being the vaguely mongoloid mixed meso- and brachycephalic element which appeared sporadically in the forest region of Russia, and occasionally to the south, from the beginning of the Russian Neolithic

[51] See Chapter IV, pp. 113–115.
[52] Czekanowski, J., **AFA**, vol. 48, 1925, pp. 65–76.
[53] Günther, H., *Rassenkunde der deutschen Volkes.*
[54] Luschan, F. von, **JRAI**, vol. 41, 1911, pp. 221–244.
[55] Pruner Bey, F., **MSAP**, vol. 2, 1865, pp. 417–432.

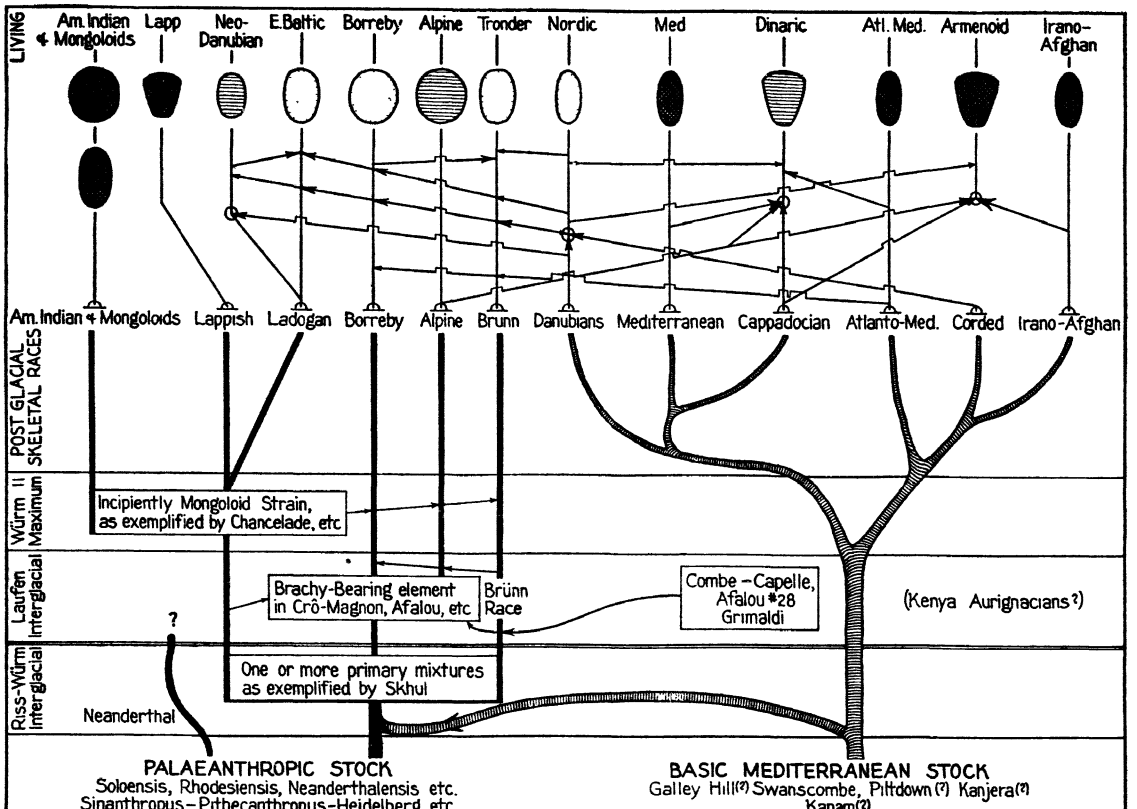


FIG. 30. SCHEMATIC REPRESENTATION OF WHITE RACIAL HISTORY.

onward. To this same side of the chart are added the modern mongoloids and the mongoloid element in the American Indian.

The lower half of the chart seems relatively simple in comparison with the upper portion, in which an attempt is made to show the relationships between these skeletal races and the living. The comparative simplicity of the lower portion, however, may reflect ignorance on our part rather than actual genetic isolation, since there was undoubtedly much mixing back and forth between the branches of each of the major lines, as well as between the lines themselves.

The proposed classification of living whites and near-whites, which is shown on the top of the chart, may be listed in more detailed form as follows:

A. LARGE-HEADED PALAEOLITHIC SURVIVORS

(1) *Brünn:* (Crô-Magnon, to some extent) found in solution with Borreby, Nordic, and other elements, mostly in Scandinavia and the British Isles, also in North Africa and Canary Islands. May appear in comparatively pure form among individuals although nowhere as a total population.

(2) *Borreby:* Large-headed brachycephals of Ofnet-Afalou type, the unreduced brachycephalic strain in Crô-Magnon; found in solution in peripheral regions of northwestern Europe, and as a major population element in most of northern and central Germany, and in Belgium. Like the Brünn race, with which it is often associated, it occurs also in North Africa and the Canary Islands.

B. PURE AND MIXED PALAEOLITHIC AND MESOLITHIC SURVIVORS OF MODERATE HEAD SIZE[56]

(3) *Alpine:* A reduced and somewhat foetalized survivor of the Upper Palaeolithic population in Late Pleistocene France, highly brachycephalized; seems to represent in a large measure the bearer of the brachycephalic factor in Crô-Magnon. Close approximations to this type appear also in the Balkans and in the highlands of western and central Asia, suggesting that its ancestral prototype was widespread in Late Pleistocene times. In modern races it sometimes appears in a relatively pure form, sometimes as an element in mixed brachycephalic populations of multiple origin. It may have served in both Pleistocene and modern times as a bearer of the tendency toward brachycephalization into various populations.

(4) *Ladogan:* I propose to give this name to the descendants of the mesocephalic and brachycephalic forest-dwelling population of northern Europe east of the Baltic in Kammkeramik times. This type is a blend of a partly mongoloid brachycephalic element with a mesocephalic form of general Upper Palaeolithic aspect; these elements are seen in crania from Lake Ladoga and Salis Roje. (See Chapter IV, section 13, pp. 125–126.) Corded and/or Danubian elements are inextricably blended here, although the mongoloid

[56] Foetalization in a skeletal sense, which is, for obvious reasons, the only sense implicit here, involves a reduction of male secondary sex characters in the skull, and at the same time a reduction in skeletal sex differentiation.

and Upper Palaeolithic elements seem at present more important. In its present form this composite type shows two numerous variants:

(a) *Neo-Danubian:* Strongly mixed with the old Danubian, and to a lesser extent other elements, to form the common peasant type of eastern Europe, with many local variants.

(b) *East Baltic:* Strongly mixed with Corded, Iron Age Nordic, and western Palaeolithic survivors to form the predominant population of much of Finland and the Baltic States.

(5) *Lappish:* A stunted, highly brachycephalized, largely brunet relative of the Ladogan, originally living to the east of the Ladogan type area, in the Urals and western Siberia. Has probably assimilated some evolved mongoloid, but owes its partly mongoloid appearance more to the retention of an early intermediate evolutionary condition. In modern times much mixed with Ladogan and Nordic.

C. PURE AND MIXED UNBRACHYCEPHALIZED MEDITERRANEAN DERIVATIVES

(6) *Mediterraneans:* Within this general class, which still retains much of its original racial unity, the following sub-classes may at present be distinguished:

(a) *Mediterranean Proper:* Short-statured, dolicho- and mesocephalic form found in Spain, Portugal, the western Mediterranean islands, and to some extent in North Africa, southern Italy, and other Mediterranean borderlands. Its purest present-day racial nucleus is without doubt Arabia. Most of the Cappadocian, isolated in the skeletal material, seems to have been absorbed into the western Mediterranean variety after its early Metal Age migration, while that which remained in Asia Minor became assimilated into the Dinaric and Armenoid. It still appears, however, among individuals in its original form, and is particularly common among Oriental Jews.

(b) *Atlanto-Mediterranean:* The tall, straight-nosed Mediterranean, not mesocephalic, as Deniker erroneously stated, but strongly dolichocephalic. Today this race forms the principal element in the population of North Africa, and is strong in Iraq, Palestine, parts of Arabia, and the eastern Balkans; in solution with varying degrees of negroid it is also the principal race in the whole of East Africa. In Europe it is a minority element in the Iberian Peninsula, Italy, and the British Isles.

(c) *Irano-Afghan:* The long-faced, high-headed, hook-nosed type, usually of tall stature, which forms the principal element in the population of Iran, Afghanistan, and the Turkoman country, and which is also present in Palestine, parts of Arabia, and North Africa. It is probably related to the old Corded type of the Neolithic and Bronze Age.

(7) *Nordics:* The basic Nordic is the Corded-Danubian blend of the Aunjetitz and of the Early Iron Age in central Europe. This type includes some Bell Beaker Dinaric absorbed in early Metal Age times. Although Danubian and Corded types may appear as individuals, they may nowhere be isolated as populations. The most important living Nordic varieties are:

(a) *Keltic Iron Age Type:* The Keltic sub-type, mesocephalic and low-vaulted, with a prominent nose. Commonest in the British Isles where in places

it forms the principal element in the population. Also a major element in Flanders and the Frankish country in southwestern Germany.

(b) *Anglo-Saxon Type:* The old Germanic Reihengräber type, a heavy-boned, rather high-headed Nordic variety, most prevalent in northern Germany and England.

(c) *Trondelagen Type:* A hybrid type of Nordic with Corded and Brünn elements, frequent in the central coastal provinces of Norway, north of the Dovre Mountains; the principal form in Iceland, and among the Frisians, and common in the British Isles. The Anglo-Saxon type lies between it and the true Nordic.

(d) *Osterdal Type:* The original Hallstatt Nordic, smaller-headed and finer boned than (b) or (c); occurs in many populations as individuals, typical only in Sweden and in the eastern valleys of Norway.

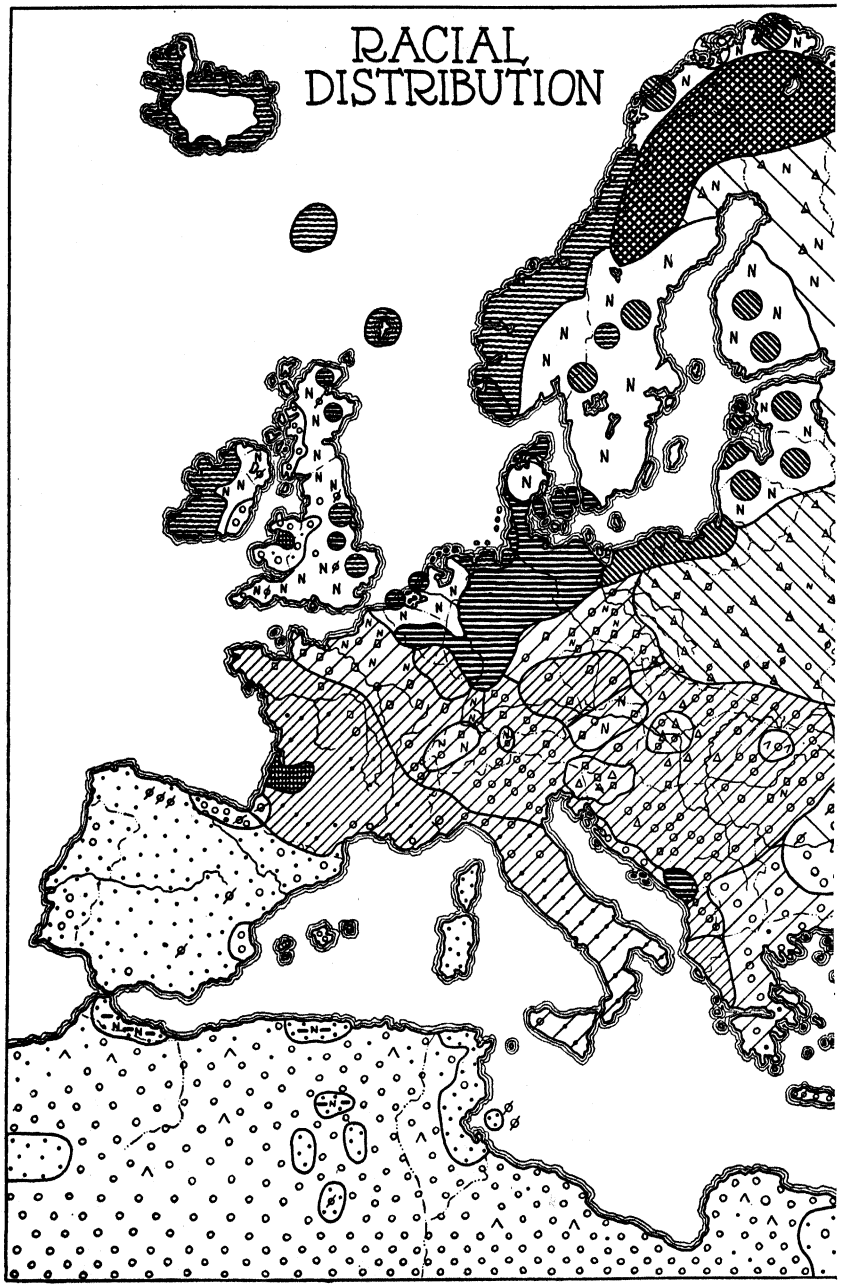
D. BRACHYCEPHALIZED MEDITERRANEAN DERIVATIVES, PROBABLY MIXED

(8) *Dinarics:* A tall brachycephalic type of intermediate pigmentation, usually planoccipital, and showing the facial and nasal prominence of Near Eastern peoples. The basic population of the whole Dinaric-Alpine highlands from Switzerland to Epirus, also in the Carpathians and Caucasus, as well as Syria and Asia Minor. Apparently a brachycephalized blend in which Atlanto-Mediterranean and Cappadocian strains are important, with Alpine acting as the brachycephalizing agent in mixture. Borreby and Corded elements, also Nordic, appear to be involved in some regions.

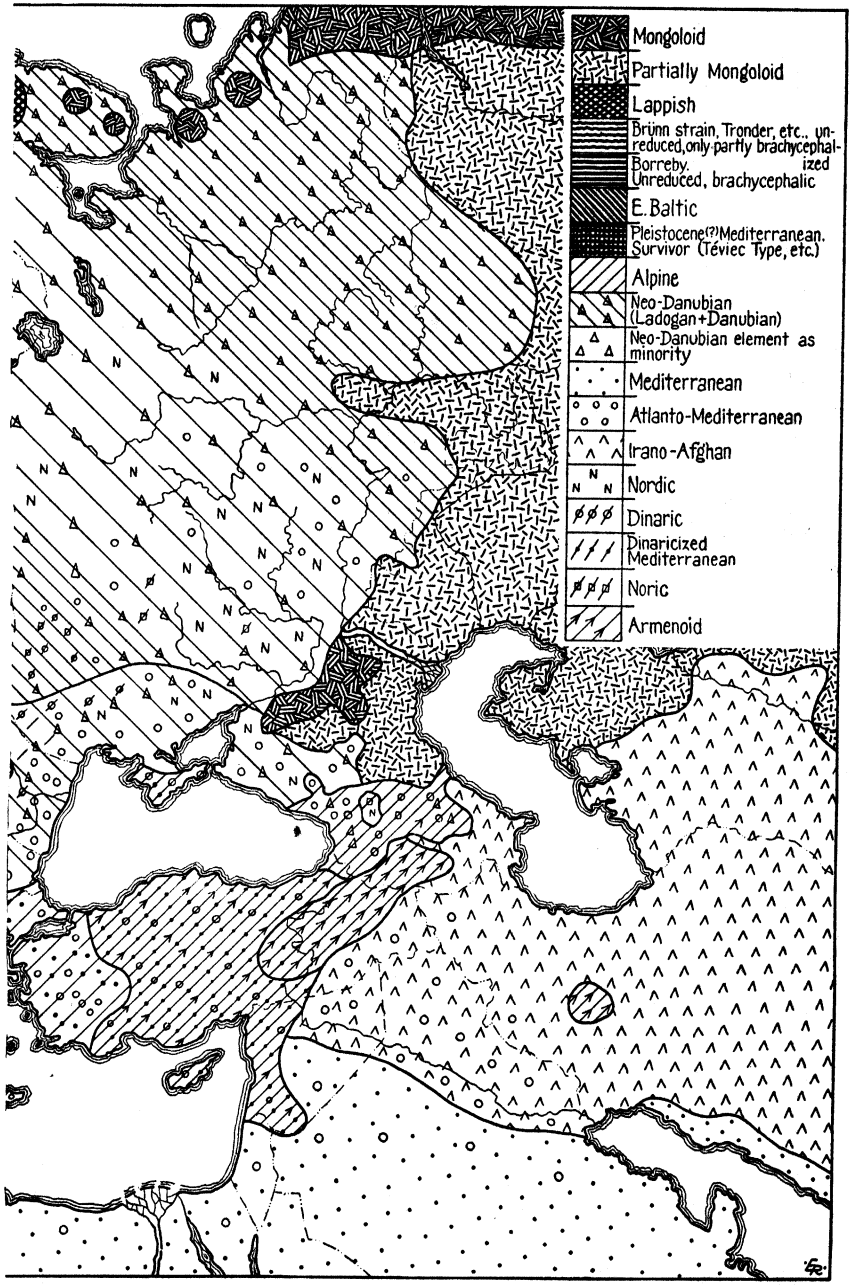
(9) *Armenoids:* A similar brachycephalic composite type, with the same head form as the Dinaric, but a larger face and nose. The pigmentation is almost entirely brunet, the pilous development of beard and body abundant, the nose high rooted, convex, and the tip depressed, especially in advanced age. The difference between the Armenoid and the Dinaric is that here it is the Irano-Afghan race which furnishes the Mediterranean element, brachycephalized by Alpine mixture.

(10) *Noric:* A blond, planoccipital brachycephal frequently encountered in South Germany and elsewhere in central Europe. This is apparently an Iron Age Nordic brachycephalized by Dinaric mixture and seems in most respects to take the form of a blond Dinaric variant. Both Deniker and Czekanowski have recognized this type, and it is a standard race, under various names, in most Russian studies. The name Noric was given it by Lebzelter. A brachycephalized Neo-Danubian, common in Jugoslavia, is a parallel or variant form.

The ten racial types within the white race listed above, with their subtypes, form two of the three main divisions of the white race, in its widest sense, when segregated on the basis of head size. The third division, that of the peoples with small heads, includes the aboriginal population of southern Arabia east of the Yemen, and various groups in Baluchistan, and again in southern India. This third variety is characterized by an abundance of wavy or ringleted hair, and facial features of a Veddoid character which in some instances suggest Australoid affinities. This third


RACIAL
DISTRIBUTION

MAP


Mongoloid
Partially Mongoloid
Lappish
Brünn strain, Tronder, etc., unreduced, only partly brachycephalized
Borreby. Unreduced, brachycephalic
E. Baltic
Pleistocene(?) Mediterranean. Survivor (Téviec Type, etc.)
Alpine
Neo-Danubian (Ladogan+Danubian)
Neo-Danubian element as minority
Mediterranean
Atlanto-Mediterranean
Irano-Afghan
Nordic
Dinaric
Dinaricized Mediterranean
Noric
Armenoid

division need not, however, concern us here, because it falls outside the major range of the white race. It will be dealt with in some detail in the proper section of the regional study.

Besides the European races proper, as listed in the preceding paragraphs, and their Veddoid collaterals, there are certain fully evolved non-white races which have influenced the European population by intrusion and blending. These include at least two of the sub-divisions of the mongoloid family—the Buryat-Mongol, to which the Avars in part belonged, and which is today represented on European soil by the Samoyeds; and the Tungusic, the type of the early Huns. To these may be added an apparently stabilized mixed form, resembling a partially mongoloid Dinaric, to which many central Asiatic Turkish tribesmen belong. In addition to these Asiatics, there remains the African Negro, which has had certain influences upon the formation of race in the Mediterranean region, especially in North Africa, and in parts of Arabia. Other non-white stocks, such as the Australoid, Negrito, and Khoi-San (Bushman-Hottentot), have not affected the white group in its homelands in any discernible way.

Chapter IX

THE NORTH

(1) INTRODUCTION

The remaining chapters of this book will be devoted to a rapid survey of the continent of Europe, country by country and people by people, and of the contiguous portions of Asia and Africa occupied by basically white populations. The treatment of the skeletal documents in prehistory and history, and the survey of the living material as a whole, which have preceded this section, will make elaborate introductions unnecessary. Here it is proposed to cover the geography of the white race piecemeal, for the convenience of the reader interested in specific local problems, as well as to examine in further detail the nature of the white human division as a whole.

Every map is two dimensional, and every consecutive written work one dimensional. There is a conflict, therefore, at the start between the nature of any geographical material and the medium through which it is to be described and explained. The choice of a starting point is a purely arbitrary affair, and the sequence of areas followed must be equally dogmatic. Perhaps because of our European habit of starting a written page at the upper left hand corner and working down, strip by strip, we shall follow this system, more or less, in our study of the map of Europe.

By following this method we shall first deal with the very northernmost zone, which is, in effect, a more or less unified environmental area. It is at the same time the last portion of the European land-mass to receive permanent settlement, and the last to receive the cultural stimulus of agriculture. For these and other reasons, all of which resolve themselves ultimately into the fact that northwestern Europe was the center of Old World glacial activity during the last age of ice, the far north has played the zoölogical rôle of a marginal area. Its racial history, while complex enough in the absolute sense, is relatively simple and relatively easy to untangle, as has been shown in previous chapters.

Aside from the Russian Slavs whose appearance in the north is of recent historical date, we have, in this zone, to deal with two linguistic groups—the Uralic, with sub-divisions into Finnic, Ugric, and Samoyedic; and the Indo-European, in Scandinavian and Baltic forms. From the standpoint of race in the sense of major world groupings, we are concerned with two—the white and the mongoloid. In the historical sense,

we are confronted again with a division between Palaeolithic survivors, and the descendants of the farthest wandering of Mediterranean food-producers. From the standpoint of environmental conditioning in its effect upon the human form, we have reached an area of maximum differentiation. Northern Europe, especially northwestern Europe, has served not only as a refuge area for archaic humanity, but also as a source from which migrations of vast compass have spread southward into warmer lands at times of environmental distress. Emigrants forced out by the vagaries of its treacherous climate have not only affected in varying measure the rest of Europe, but have likewise played a principal part in the peopling of the New World.

(2) THE LAPPS

If the white race spreads far beyond the arbitrary boundaries of the European continent to the south and east, the opposite may be said of the north. In the circumpolar zone which fringes the Arctic Sea, Asia encroaches upon Europe, and except for Iceland, the racial uniformity of this frigid ring is, superficially at least, complete. In a far less superficial sense, is the cultural uniformity valid. From Greenland to Lapland one finds short, lank-haired people driving across the frozen tundra in bone-shod sleds, drawn by dog or reindeer; these hyperboreans dress themselves in warmly tailored fur garments, with trousers for both sexes alike; they live in conical huts of birch bark, or domes of rock and sod; they venerate the bear and witness the supernatural spirit flights and ventriloquistic conversations of their shamans.

With few exceptions they are all short in stature, and this shortness reaches its extreme at the two ends of the circumpolar zone, Greenland and Lappland. This shortness is accentuated in all of the circumpolar groups by a relative reduction in leg length, with a greater trunk height. The same reduction in length, probably produced by the same mechanism, has been noted in the case of the Magdalenian hunters in late glacial times. These same Magdalenians, notably Chancelade and the male Obercassel, showed at the same time an incipient degree of mongoloid adaptation, insofar as this adaptation is visible in the skull and especially the facial skeleton. It is likely that the occurrence of partial mongoloid traits in many Upper Palaeolithic survivor groups may be due to the retention of traits acquired during the final glacial maximum. In the same way all of the circumpolar groups show, in one degree or another, a certain amount of mongoloidism, and it is possible that the mongoloid stock as a whole represents a progressive mutation from a proto-white stock, of Upper Palaeolithic variety, which began in the Late Pleistocene and reached various degrees of specialization in post-glacial times.

The westernmost representatives of this circumpolar ring of peoples are the Lapps, who call themselves, in their own archaic variety of Finnic speech, *Samen*. Their country, Lapland, has no political existence, but is no less real an entity. It consists of the forested highlands of northern Sweden, which afford ideal reindeer pasturage, and the tundra-covered stretches of northern Finland, with the Norwegian coastal provinces of Troms and Finnmark, and much of the Russian Kola Peninsula. Except for small patches of forest and mountain, the Lapps are not alone in this country, but share it with a more numerous population of Finns and Norwegians, with whom they have, for centuries, been mixing.

There are, in the whole world, probably no more than 32,000 Lapps.[1] Of these about 21,000 live in Norway, 7000 odd in Sweden, and 3000 more are evenly divided between Finland and Russia. In Norway, which holds thus two-thirds of the total, between ten and eleven thousand are concentrated in the province of Finnmark, where, in 1920, they formed 24 per cent of the population. In Sweden the greatest concentration is in Norrbottens län, which holds 4500. The Lapps are not, from the standpoint of numbers, an important people in the world. They are one of the marginal, vestigial groups destined to disappear by the process of absorption. Their importance lies, however, in their taxonomic position, and in the influence which they have had in the past, and may have in the future, on other European peoples with whom they have blended and will blend.

Their predilection for this blending process is so great that it is really very difficult to estimate their numbers, and the figures given above are by no means definitive. They include Lapps who speak their own language and call themselves ethnically *Samen*, and exclude those who have passed over into other populations, notably the northern Norwegian. At the same time they include many Norwegian, Swedish, and Finnish genetic lines which have been incorporated into the culturally Lappish body.

Norwegian writers usually divide the Lapps into two main classes, the Reindeer Lapps, living in the forests and mountains, and the Sedentary Lapps, living along the coast and rivers, subsisting mostly on fish. It is generally believed that the original Lapps who entered Scandinavia were reindeer-herders, and that for many of them the sedentary life is a relatively recent readaptation. Today, however, no more than five thousand still herd reindeer, and of these five, three live in Sweden. Thus although Norway holds the majority of the world's Lapps, those who preserve the purest Lappish type, both in culture and race, live over the Swedish border.

The Lapps present a distinct problem to students of race, which has been answered in one way or the other by various authors since the middle

[1] Wiklund, K. B., **GR**, vol. 13, 1923, pp. 223–242.

of the last century. The problem is: are they primitive European brachycephals, related to the Alpines of west central Europe, or are they mongoloid invaders from Asia? This question is of more than taxonomic value, because it is intimately concerned with the historical position of all the western European brachycephals as well as with the validity of the classifications employed by the present schools in Poland and Germany. Fortunately, with the publication in 1935 of Schreiner's *Zur Osteologie der Lappen*,[2] we are at length in a position to answer the Lapp question in a definite manner, and with some degree of assurance. The answer lies partly in the historical field, and partly in that of somatology.

The historical evidence does not favor the Alpine or local shrunken-Palaeolithic-survivor theory. In the first place, the Lapps speak a Finnic dialect which is classified with the extinct Chude, spoken in the early centuries of the present era in Finland and the regions immediately east and north of the present city of Leningrad.[3] The Chudes were Volga Finns who migrated in early times into the regions later to be occupied by their modern Finnish and Esthonian relatives, who eventually absorbed them. In the Lappish language are also found certain loan words from Letto-Lithuanian, and others from early Scandinavian. Letts and Lithuanians arrived in the Baltic lands only in the middle of the first millennium A.D. Then the Lapps could not have moved to the far northwest much before this time. Furthermore, in order to have borrowed their language from the Chudes, who themselves did not arrive there much earlier, the Lapps must have mixed to some extent with them, and indeed the Lappish skeletons disinterred in Scandinavia show mixture with a Finnic type from the beginning.[4]

In the fourteenth century the Lapps were mentioned in the Lake Onega region, and tax registers from the sixteenth century establish their presence as far south as Lake Saima, a short distance farther north; hence it is certain that the Lapps had not been fully pushed up into their Arctic environment until recent times. In Norway, the earliest graves, found in Finnmark, may date from late "Roman" times, near the middle of the first millennium A.D., but the presence of the Lapps in this country is not absolutely certain before the ninth century. At this time Norse traders and settlers were sailing around the North Cape, into the previously unknown provinces of Troms and Finnmark, and they met Lapps there and mixed with them. A rich Viking grave of the tenth century, in eastern Finnmark, contains the skeleton of a twenty year old youth of manifestly mixed Norse and Lappish ancestry.[5]

[2] Schreiner, K. E., *Zur Osteologie der Lappen.*
[3] Wiklund, K. B., *loc. cit.*
[4] Schreiner, K. E., *op. cit.*, vol. 2, p. 279.
[5] Schreiner, Alette, *Anthropologische Untersuchungen in Norge; Hellemo.*

Schreiner has collected some 300 Lapp skeletons from graves along the Norwegian coast, all of which were of Lappish construction or contained typically Lappish grave furniture; there is no reason to confuse them either with contemporary Viking graves or with the earlier remains of the Stone Age people of this region, for the Lapp graves are manifestly late and intrusive. Furthermore they are geographically restricted, for the Lapps did not, before the sixteenth century, range below 63° N. Latitude, and the most southerly Lappish burials yet found are at Steinkjaer on the inner Trondhjem fjord. The Lapp inroad of the eighteenth century into South Trondelag and Hedmark came not from the north, but from the Swedish provinces of Jämtland and Härdjedalen, to the east. The Lapps did not, therefore, extend south into central Norway until very recent times, and had no opportunity to mix with Norwegians in any numbers south of Tydsfjord, the northernmost fjord-valley of Nordland. They cannot, therefore, have been responsible for the brachycephaly in southern Norway. Although there is no skeletal material from the Stone Age sites of northern Norway, there is no reason to suppose that these people were the ancestors of the Lapps, since Lapp sites and Stone Age sites are distinct, and nothing transitional has been found.

On the historical side, the evidence is clear. In regard to somatology we may be equally positive, since there is no lack of anthropometric material. Series by Bryn,[6] Alette Schreiner,[7] Gjessing,[8] Geyer,[9] Kajava,[10] and Zolotarev [11] represent Lapps from Norway, Sweden, Finland, and Russia; these studies are all modern and cover the living material fully, while K. E. Schreiner's skeletal series provides a check upon the dead. All of these series show that the Lapps are very mixed, and that they contain not only Nordic blood, derived from Norwegian contact, intense during the last four centuries, but also a blond brachycephalic element which presumably comes from their even commoner mixture with the Kvaens, the northernmost of Finns. Several attempts have been made to isolate "pure" Lapps, but this isolation must be relative since they were probably mixed before they arrived in the present Lappland.

It is generally assumed that the Lapps were originally brunet, and that what blondism they possess has been acquired through this mixture. There is, of course, no factual basis for this assumption, and if it be true, the Lapps must have more non-Lapp than Lapp blood. Hair color was

[6] Bryn, H., **MAGW**, vol. 62, 1932, pp. 1–74.
[7] Schreiner, A., *Die Nord-Norweger; Hellemo (Tysfjord Lappen).*
[8] Gjessing, R., *Die Kautokeinolappen.*
[9] Geyer, E., **MAGW**, vol. 62, 1932, pp. 163–209.
[10] Kajava, Y., *Beiträge zur Kenntnis der Rasseneigenschaften der Lappen Finnlands.*
[11] Zolotarev, D. A., *Kolskie Lopari.*

observed by means of the Fischer scale in six modern studies,[12] while in two others [13] no scale was employed, but the material is capable of comparative use. In these series the adult male Lapps vary, in black to dark brown hair colors, from forty to eighty per cent; the beard color, when observed, is lighter. There is some argument as to whether the pure brunet Lapp hair is really black or dark brown, which would indicate that it often falls into a borderline category. When blond, it is usually ashen, and almost never golden or red. The selected "pure" groups, Bryn's Reindeer Lapps, and some of Geyer's mountain and forest Lapps from Sweden, have seventy per cent or over of this dark hair, while the fairest Lapps, with a majority of brown and blond shades, are found in Finland and in the Kola Peninsula.

Pure dark eyes are found among one-third of Reindeer Lapps, and among as few as eight per cent in the total of Lapps from Norway.[14] Pure light and light-mixed eyes are commonest among the Lapps of Finland, where they total between thirty and forty per cent, and least common among the Reindeer Lapps of interior Norway and Sweden. Even among the purest selected sub-groups, such as that of Geyer, who isolated from a larger Swedish Lapp sample a few individuals of most pronounced Lappish type, at least a third are light or light-mixed in iris color.

The skin color of Lapps with light hair and eyes is as light as that of Norwegians and Finns, but in the majority, with mixed or dark hair and eye pigmentation, the skin tends to a grayish yellow to yellowish brown, with some moderately dark individuals, equivalent in pigment intensity to Spaniards or Italians.[15] On the whole the skin is lighter on the face and darker on the body, and is usually darkest on the abdomen and genitalia.[16] Among the old this skin becomes deeply wrinkled, since it is then deficient in sub-cutaneous fat. The eyes are set in deeply excavated sockets in senility, owing to the same fat deficiency.

The Lapp hair is thick on the head, usually straight or but slightly wavy; it is of moderate texture, and seldom coarse or wiry in a truly mongoloid manner. Graying begins late, and baldness is rare. The beard,

[12] Bryn, H., **MAGW,** 1932.
Geyer, E., **MAGW,** 1932.
Gjessing, R., *Die Kautokeinolappen.*
Schreiner, A., *Die Nord-Norweger; Hellemo.*
Luther, M., unpublished data in Peabody Museum. Actual hair samples collected, and later matched in the laboratory.

[13] Kajava, Y., *Beiträge zur Kenntnis der Rasseneigenschaften der Lappen Finnlands.*
Zolotarev, D. A., *Kolskie Lopari.*

[14] Schreiner, A., *Die Nord-Norweger,* Martin's numbers 2–4, total of 254 males.

[15] Bryn, H., **MAGW,** 1932, finds 20 per cent to have von Luschan #3; the darkest shade which he records is #12.

[16] Schreiner, A., *Hellemo,* p. 15.

except where much Nordic blood is apparent, is very scanty, consisting of a few widely separated hairs. The body hair again is largely deficient, for there is seldom any on the chest or abdomen; even the pubic hair is scanty, and on men as well as on women its area of growth is sharply outlined at its upper border. The external genitalia which this hair partly conceals are as a rule small.

Thirty different series give the stature of the Lapps over a span of 130 years. Eleven series published between 1870 and 1900, give means of 138 to 156 cm., which could be averaged at 151 cm. Twenty-seven others, measured between 1905 and 1934, and including several thousand Lapps, range from 155 to 164 cm.; [17] during this period the Lapps grew, apparently, seven or eight centimeters. This may be accounted for either as evidence of continuous progressive mixture, or the influence of the stature increase tendency in northwestern Europe, or both.

A study of Lapp bodily proportions shows that the trunk is long in proportion to the legs, which are especially short in the tibial segment, and often bowed; the arms are relatively long, especially in the humeral segment. The hands and feet are as a rule small and delicate. Despite the great relative arm length, both shoulders and hips are narrow, and these peculiarities are especially accentuated in the more brunet, shorter, and presumably less mixed segment of the Lapp population.[18]

The head of the Lapps, while large in proportion to the body size, is absolutely small. The length ranges in the low 180's, and the breadth in the 150's, while the height is probably about 122 mm. The cephalic index means range from 80 to 88; and a large list of series shows no change during the last century. There are, however, regional differences; the center of extreme round headedness lies among the inland groups in northern Norway, while the Swedish, Finnish, and Kola Peninsula Lapps become progressively narrower headed. The mean for the purest Reindeer Lapps of Norway is 87; for the easternmost Lapps, 80 to 83.

The forehead of the Lapps is narrow in proportion to the parietal breadth; the profile of the head from above is a short ovoid. The occiput is flat-curved, with some flattening at lambda. Browridges, as a rule, are absent, and the forehead is usually steep, and frequently equipped with frontal bosses. The faces of the Lapps are extraordinarily short, with well-substantiated means of 112 mm. for nasion-menton height. These may be compared with the means of 124–126 mm. usual among either Norwegians or Finns. In this the Lapps differ from known whites or mongoloids to an extraordinary degree, and an extreme absolute facial shortness must

[17] For a complete bibliography of early Lappish series, see the lists of Bryn, the two Schreiners, Geyer, Kajava, and Zolotarev.

[18] Geyer, **MAGW**, 1932.

be considered a distinctive Lapp feature. Upon further examination, it may be seen that this shortness lies almost entirely in the masticatory segment of the face height; the alveolar borders of the maxillae are extraordinarily shallow, and the mandible is very low, weak, and feebly developed.[19] The jaw is not, however, narrow at the rear, for the bigonial diameter is as great as 108 mm. on Norwegian Lapps, and greater even among "pure" Nomads.[20] The jaw converges rapidly toward the chin, which is small, pointed, and frequently receding. The teeth are very small, and their roots short. Thus the Lapp face is distinguished by a reduction of jaw size and an oral shallowness extreme and perhaps unique among mankind. It must be considered as a Lapp specialization coincident with their extremely short stature, and especially with the shortening of the distal leg segment.

Otherwise the Lapp face takes a position midway, in many respects, between whites and mongoloids. The bizygomatic diameter, of 140 mm., or thereabouts, is in the white range; it is narrow in proportion to the vault, but it seems wide in relationship to jaw and forehead. The malars, while not notable for lateral jut, project forward prominently. The nose is on the whole low and flattish; with a straight or concave bridge, low root, and a peculiar snubbed or pointed, up-turned tip. This prominence of the tip is retained characteristically in mixture. On the whole the nose is mesorrhine, and is in this respect not unlike those of many of the Finnish and Slavic peoples in eastern Europe. The eyes are widely separated, set in low orbits, and overhung in some instances with median or external folds, rarely with the mongoloid epicanthus.

On the whole, the Lapp crania, as the Lapp soft parts, take an intermediate position between mongoloid and white standard forms. In some special characters the Lapps are unique, as in the masticatory development, and in the orbit, where Hisinger-Jägerskiöld has found a curiously primitive bony conformation.[21] The possession of these peculiar specializations and primitive traits should prevent the Lapps from being considered a hybrid mongoloid-white racial form. Compared to central Asiatic mongoloids, the Lapps are little specialized. The soft and often fine head hair, the absence of the blue-black hair pigment shade, the infrequency of the mongoloid eyefold, and the absence of an excessive lateral malar development or of great facial width, are evidence of this lack of specialization in a mongoloid direction.

There are many features which give the Lapps an infantile appearance which cannot be accidental; these include the body and limb proportions,

[19] Schreiner, K. E., *Zur Osteologie der Lappen.*

[20] Bryn, H., **MAGW,** 1932.

[21] Kajava, Y., *Beiträge zur Kenntnis der Rasseneigenschaften der Lappen Finnlands*, p. 35, after Hisinger-Jägerskiöld, E., **FFVS,** vol. 55, 1913.

the sparseness of body hair, the small genitals, the bulbous forehead with a smooth supraorbital region, the weak chin, and the low, child-like nose.[22] Some environmental mechanism working upon the mineral economy of this peripheral human group has probably produced this size reduction and infantilism.[23]

Schreiner's opinion, based upon a detailed study of Lapp craniology as well as upon the living material, is simple and adequate. Translated into the terms of the present study, it signifies that the original ancestral Lapps represented a stage in the evolution of both the Upper Palaeolithic Europeans and the mongoloids, and that while the mongoloids have specialized in their own characteristic way, and while the Ice-Age European strain was modified by mixture with and virtual absorption by the encroaching post-Pleistocene food producers, the ancestral Lapps were, in their turn, modified largely by a general size reduction and an increasing infantilism. The jaw reduction of the Lapps is their most easily identified specialization.

In view of the known history of Upper Palaeolithic whites and of mongoloids, this divergence of the Lapps from the others must have taken place as early as the Laufen glacial retreat. Their area of specialization was presumably western Siberia, where they found room in which to specialize with little interference. From here they must later have spread over Finland and northwestern Russia, whence they entered northern Scandinavia sometime during the first millennium of the Christian era, by a gradual trickling process. In their northern wanderings they may have met the Samoyed, and from them acquired their domestic reindeer and the habit of reindeer milking. Since, according to both Laufer and Hatt,[24] this last trait did not develop in its central Asiatic home much before the middle of the first millennium B.C., the Lapps could not have acquired this practice much before their arrival in Scandinavia. The acquisition of this superior economy must have given them an impetus for northward expansion, as it did, farther east, with the Tungus.

We must not look for Lappish ancestors, therefore, in the large-headed Borreby people of Mesolithic and Neolithic Denmark, nor in the occupants of the Stone Age sites of northernmost Norway; if we find Lapp-like

[22] This general estimate of the Lapp racial position is for the most part a paraphrase of K. E. Schreiner's conclusions in his *Zur Osteologie der Lappen*, by far the most erudite work yet to appear on the Lapp question.

[23] Gjessing, R., *Die Kautokeinolappen*, pp. 90–95.

Marett, J. R. de la H., *Race, Sex, and Environment.*

[24] Hatt, G., *Notes on Reindeer Nomadism*, **MAAA**, vol. 6, 1919. This is one of the few points regarding the history of reindeer husbandry upon which these two authorities agree.

Laufer, B., *The Reindeer and Its Domestication*, **MAAA**, vol. 4, #2, 1917; **AA**, vol. 22, 1920, pp. 192–197.

physical traits, as do Czekanowski, Mydlarski, and others, among eastern European brachycephals, and even among western European Alpines, we must remember that some of the Lappish peculiarities, including perhaps their specialized nasal tip form, may have been common possessions of the Upper Palaeolithic European peoples as well. As we shall see later, there may have been transitional forms between Lapps and Europeans, and this general class of humanity may be responsible for the wide-eyed brachycephals who, as we saw in our historical chapters, appeared now and then in southern Russia and Poland from the beginning of the Neolithic onward.

(3) THE SAMOYEDS [25]

In the eastern extension of their territory the Lapps share the Kola Peninsula with their neighbors and fellow reindeer-herders, the Samoyeds. The Lapps represent, however, a much older population, for the Samoyeds have only lived there for a few centuries. There are, according to Russian authorities, only 16,500 Samoyeds in the world; of these 4000 live on the Kola Peninsula, another 5000 range between the White Sea and the mouth of the Yenisei River, and the rest hunt between the Obi and Yenisei rivers, and in the Yenisei drainage. Thus the bulk of the Samoyeds still inhabit their Siberian home. All of those mentioned speak a language which constitutes one of the two primary divisions of Uralic speech. It seems to be definitely related to Finno-Ugrian, although its supposed kinship to Tungus, Mongol, and Turkish has been questioned.

Other Samoyeds, who have been Turkicized in language, and to a large extent in manner of living, dwell in southern Siberia, in the provinces of Yeniseisk, Tomsk, and Irkutsk, and also in Mongolia. These go under the names of Soyots, Karagas, and Uriankhai; they are more numerous than the Samoyeds proper. Whatever their earlier history, the Samoyeds, without reasonable doubt, may be considered to have developed as an ethnic and linguistic group in the region north of the Altai Mountains, the general center of Altaic-speaking Mongoloids.[26] Their spread northward into Siberia and thence to the Arctic rim of Europe must have been a relatively recent phenomenon.

In central Asia the Turkicized Samoyeds are definitely and fully mongoloid, and belong to the Buryat-Mongol variety, which we have encountered historically among the Avars. Those who live in Europe have brought the same physical type with them with but little modification.

[25] Non-anthropometric data mostly from Jochelson, W., *Peoples of Asiatic Russia;* and from *Les Voyages du Professeur Pallas.*

[26] Professor G. J. Ramstedt of Helsingfors University has expressed the opinion that the original bearers of Samoyedic speech must at one time have moved to the Altai region from a point nearer the Finno-Ugrian homeland.—Private Communication.

Cranially they resemble the Lapps in vault size and dimensions,[27] but the Samoyed facial skeleton is wider and larger, with a more nearly mongoloid development of the malars.

Our material on the living is sufficient in numbers and detail to permit a confirmation of this mongoloid character.[28] The stature, with a mean of 154 cm. in 1887, had risen to 156.8 cm. in 1914, providing that the same groups were represented. Like the Lapps, the Samoyeds are short, and like them relatively long bodied. They are brachycephalic, but not to the extent attained by the western Lapps in Norway; they are euryprosopic and mesorrhine.

Although the mongoloid character of the Samoyed may easily be seen in their flattish, round faces, everted lips, and up-tilted, low-bridged nose, and in their scarcity of beard, one cannot call them purely or completely mongoloid. Photographs of Samoyeds [29] show a considerable number with partially European features. Sommier's data on hair and eye color, again, shows some thirty per cent with mixed or light eyes, and the same number with hair ranging from medium brown to blond. As with the Lapps, the women are notably darker in hair and eye color than the men. This pigmentation variability, in view of the sex linkage, would indicate that the Samoyeds as well as the Lapps, but in lesser degree, had been subjected to mixture with peoples of European racial character. This mixture may be explained in several ways: (a) by the retention of an early non-mongoloid condition derived from ancient Uralic-speaking ancestors; (b) by contact with central Asiatic Nordics before the departure of the Samoyeds for Europe; (c) by mixture with Ugrians, Finns, Slavs, and others in western Siberia and northern Russia.

(4) SCANDINAVIA; NORWAY

The northern zone of Europe which we have chosen as the subject of our first regional chapter is in reality two zones; besides the northernmost, which runs closely around the Arctic rim, is a second, that of Scandinavia and the lands to the east of the Baltic. Here food production is possible, and the effect of environment does not necessarily take the form of infantilism and stunting. In contrast to the first, this second zone is occupied by large, typically European groups of people.

[27] Schreiner, K. E., *Zur Osteologie der Lappen*, pp. 280–281.
Sommier, S., **APA**, vol. 17, 1887, pp. 71–222.
Klimek, S., *ibid.*, vol. 59, 1929, pp. 13–31.
[28] Roudenko, S. I., **BMSA**, ser. 6, vol. 5; 1914, pp. 123–143.
Sommier, *loc. cit.*
Zograf, N. J., **AAM**, 1879, vol. 2, pp. 61–87. From resumé by Stieda, **AFA**, vol. 14, 1883, p. 291.
[29] Peabody Museum Collection. Courtesy of the Institute of Northern Peoples, Leningrad.

Norway occupies the poorer and more rugged half of the Scandinavian Peninsula. The mountain crest which separates it from Sweden runs to the west of a central line, and swings to the northeast in such a way as to give to Norway the northernmost part; so that much of Norway, and relatively little of Sweden, lies within the Arctic circle. Deep fjords along most of the Norwegian coast cut far into the land, in some cases nearly bisecting the kingdom. A large proportion of the country is mountainous, but aside from the central spine, only one range deserves mention here—that of the Dovre Mountains, which separates Møre and Trøndelagen on the north from Opland and Hedmark on the south. Only in the long, eastern valleys such as Østerdal and Gudbrandsdal, and on the plain of Oslofjord, are large unbroken stretches of reasonably flat farm lands to be found.

The topography of Norway, as outlined above, is important in its effect upon the present distribution of its peoples. While Sweden, a lake-studded plain sloping gently from the western mountain barrier to the Baltic, is inhabited by a regionally uniform population, Norway, with its rugged fjords and deeply folded valleys, provides shelter and differentiation room to a number of local types. Norway's geography, in combination with her climatic and cultural history, makes her one of the most marginal areas, in a racial sense, in Europe. Yet, despite her marginal character, Norway has played an important part in European racial history, since this nation has been a source of emigration to Iceland, to Normandy, and to the British Isles. Hence it has had much to do with the modern settlement of the New World, which Norwegians discovered. The physical types of many British and Americans may be traced directly to a Norwegian origin.

The racial history of Norway has been covered, insofar as we know it, in the preceding chapters. The northern coastal regions had a very late age of chipped stone, and an even later Neolithic. Food-producing peoples were few in Norway before the Middle and Late Bronze Ages, and not until the Iron Age and the full Viking period was this country fully inhabited. The greatest pre-Iron Age concentration was along the southwestern coast. Nordland, Troms, and Finnmark were explored during the pre-Christian Viking period; Troms and Finnmark were abandoned during the Middle Ages and only resettled from the sixteenth century onward. Our skeletal material, wholly Iron Age in date, shows a medley of normal Iron Age Nordic crania with Borreby brachycephals and other skulls which could be fitted without difficulty into a dolichocephalic Upper Palaeolithic category. That the Norwegian climate has not exerted a size-reducing tendency such as that which somewhere modified the ancestors of Lapps, is therefore shown by the survival of

what appear to be full-sized Ice-Age cranial types into the present millennium.

The study of living Norwegians has been carried on with exceptional competence by three modern investigators—Halfdan Bryn, K. E. Schreiner, and Mme. Alette Schreiner. The monumental *Somatologie der Norweger*,[30] by the first two named, supplemented by the regional studies of the first and third,[31] continue the earlier work of Arbo, Helland, Larsen, and the Daaes,[32] and present us with a body of accurate and objectively interpreted anthropometric data unsurpassed elsewhere.

The Norwegians, as a whole, are tall by absolute standards, and blond, with moderate body proportions which include relatively long legs and short arms. Most of them are mesocephalic, with meso- to leptoprosopic faces, and their noses are usually leptorrhine. Regional variations in Norway are relatively great for Scandinavia, but are no greater than those found in many European countries. Except for the far North, local stature means run from about 168 to 175 cm., while the cephalic index varies by parishes between the extreme means of 76 and 84. In hair and eye color, blonds and mixed forms are everywhere more numerous than brunets; dark eyes, for example, never reach the figure of 20 per cent.

Within these relatively restricted ranges there is a definite pattern of regional distribution, and there are four definite areas, each of which has its own racial peculiarities. These four areas are, (1) Eastern Norway, (2) Western Norway, (3) North-central Norway, (4) the Far North.[33]

Eastern Norway consists of the seven following provinces: Hedmark, Akershus, Ostfold, Vestfold, Opland, Buskerud, and Oslo. This section of the country, which includes the Oslofjord region and the long valleys which run towards the Dovre Mountains, forms a definite ethnic unit, within which much internal movement takes place between valleys and provinces, and much migration from the country districts to the city of Oslo. It has, however, but little to do with other parts of Norway, which are isolated from it by a number of barriers. The population of this eastern section is relatively uniform, both locally and as a whole.

Although there seems to be an almost completely submerged brachycephalic element along the coast, this is not very much in evidence, for the main racial type of eastern Norway is a regular Halstatt Iron Age

[30] Bryn, H., and Schreiner, K. E., *Somatologie der Norweger.*

[31] Bryn, H., *Homo Caesius;* Bryn, H., **AAnz,** vol. 9, 1932, #2, pp. 141–164, and earlier works.

Schreiner, Alette, *Die Nord-Norweger; Anthropologische Lokaluntersuchungen in Norge; Valle, Hålandsdal, und Eidfjord.*

[32] For bibliography of these authors, see Bryn and Schreiner, pp. 607–608.

[33] Unless otherwise designated, the following pages are based upon Bryn and Schreiner.

Nordic. This type, although predominant throughout the region, seems to be especially concentrated in the five valleys of Østerdal, Gudbrandsdal, Valders, Hallingdal, and Numendal, forming parts of the three provinces of Hedmark, Opland, and Buskerud. Here, in a region almost unoccupied before the Iron Age, Bryn [34] believes to have found a refuge area of the classic Nordic race, with less admixture of other stocks than is the case elsewhere in Norway, or for that matter, in Europe. Hence his specifications, both metrical and morphological, may serve as a standard of future comparison for use in the study of less typically Nordic populations.

Army recruits from this region serve as a basis of study, while a series of farmers of old, indigenous ancestry forms a check series which represents the original Iron Age population with a minimum of more recent admixture. These people must be considered tall, since the men attain in adult life the mean height of 172 cm., but from the Norwegian standpoint this stature is not unusual. In bodily proportions this type is relatively long legged and short bodied, moderately broad shouldered, and relatively short armed. The bones are typically small and fine, and the general musculature tends to leanness, while corpulence is very rare. On the whole the impression is given that the muscles lie close under the skin, and stand out in clear relief. A predominantly leptosome constitutional type seems to be characteristic.

The mean vault dimensions of the recruits from these valleys are: length, 195 mm., breadth, 149 mm., and auricular height, 126 mm., with a cephalic index of 76.8. The native farmers are even longer headed, with a mean index of 75.5. Since these indices reflect figures of 73–75 on the skull, it may be readily seen that the original Iron Age Nordic vault form has been transferred to eastern Norway with little or no modification. Frontal and bigonial diameters average 105 mm., while the bizygomatic mean is 135 mm. The face height, given by Bryn as 122 mm.,[35] is only moderately long. The nasal dimensions, of 55 or 56 mm. by 33.8, produce an index of 60 or 61.[36]

Ash-blond hair is typical of one-half of the native farmers, the rest having light brown and brown shades; only four per cent have hair that is black or dark brown. The rufous tinges of hair color are especially rare. Among the recruits, unselected as to provenience of ancestry, dark hair is twice as common, and the ash-blond shades are found in only one-third of the group. Thus we may, from this material, specify that the typical

[34] Bryn, H., **AAnz,** 1932; also *Homo Caesius.*

[35] It seems likely that Bryn located nasion a little lower than did A. Schreiner, judging by comparisons elsewhere. It is also likely that this mean should be nearer 125 or 126 mm.

[36] Here again I feel that Bryn's mean nose height of 54.7 mm. is a little too low, and that his nasal index of 61.8 is somewhat high.

hair color of the living examples of the Iron Age Nordic race ranges from a medium brown to an ash-blond, with a minimum of rufosity, and a small brunet minority.

The hair form most prevalent in Norway is a low waviness. Although low waves are characteristic of the southeastern valley country as well as of other regions, there is, nevertheless, a higher ratio of straight hair among this long-headed population than in other parts of Norway. Although the ratio is only 30 per cent, as against 66 per cent for the low-waved variety, yet these figures are so at variance with those for the rest of the kingdom that one may specify the hair form of this type as low-waved to straight. The beard is of but moderate abundance, although it increases considerably with age, and the body not especially hairy.

In eye color as in hair color, the native farmers are lighter than the recruits, with 86.5 per cent of light and light-mixed eyes (Martin #12–16) as against 76 per cent. Of the recruits, 38.5 per cent have pure light eyes (Martin #15–16). This is by no means the lightest-eyed region in Norway. This material shows us what had been previously suspected, that the Nordic eye must be considered light mixed in typical form, rather than pure light. According to Bryn the commonest form of unpigmented eye found in this region is a light blue one, with large meshes and iris fibers set quite far apart, so that the iris pattern appears open.

The skin color in this area, as in most of Norway, is almost invariably a pinkish white (von Luschan #3). This skin is of a fine texture; according to Bryn it is soft and easily punctured by a hypodermic needle. Owing to this thinness and the delicate quality of the skin, the cartilaginous and osseous structure of the face is often clearly discernible beneath it.

The forehead of this type is for the most part sloping, forming a profile line parallel to that of the nose. It is medium to narrow in breadth, and, in comparison to other Norwegian types, relatively flat in both planes. The browridges are usually present, but are weakly developed, and the depression of the nasal root moderate. The nose may be described as thin, steep-walled, and high-bridged. In profile, it is for the most part straight or slightly convex, with a high incidence of wavy forms, and there is usually a noticeable transition between the bony and cartilaginous portions. Owing to the thinness of the skin, the line of suture between the two nasal bones may frequently be observed. The tip of the nose is thin, and for the most part raised slightly above the horizontal plane. The nasal wings are compressed, and the nostrils form long ovals, set at a very acute angle from one another. These nostrils are visible from the side, and slightly visible from in front.

The bony orbit of the eye is rather high, and the eye normally quite wide open, with the upper lid reaching down over the upper quadrant of

the iris, and the lower lid touching its rim. The eye slits themselves are horizontal, and are often partially covered, especially in old age, by a fold which hangs from the outer corner of the upper orbit.

The eyebrows are thin, somewhat bowed, and seldom concurrent over the nasal bridge. The malars, small in size, are typically flattened in front. The zygomatic arches, however, are often bowed outward enough to give the face a pentagonoid appearance. This appearance is due to the flatness of the temples and the thinness of the soft parts of the arches, rather than to their skeletal prominence.

The cheeks are in most cases thin, and the lower jaw long and deep, curving in front to a well-developed chin, with the gonial angles compressed and usually not visible. One of the outstanding features of this type, and of the Nordic race as a whole, is the great distance between the borders of the lower teeth and the point of the chin. The total impression of the face is that of a long, narrowish oval, often slightly rhomboid, with prominent bony portions when seen in profile. The lips are usually thin, the mouth rather small, and the nasal sills well developed.

The cranium itself is a long oval when seen from above, with almost parallel sides, and a marked transition from the frontal to the temporal bones. The greatest breadth is located as often in front of the center as behind it. Seen from the front, the cranium looks steep or parallel sided, and arched or vaulted on top. From the side, the contour of the head sweeps flatly back from a somewhat retreating forehead to a curved or projecting occiput. The highest point of the head is over the ears, and there is no pronounced tendency for either the forward or rear portion of the head to be higher than the other. Judging by gross bulk measurements the heads of individuals of this type may not be classed as large, nor high; their principal character is narrowness, a feature which continues down to the face, and also to the nose.

Although this distinctive type is today most concentrated in the long valleys of southeastern Norway, it is by no means confined to that region. It is found all over Norway in greater or lesser solution, as is to be expected, since it is the racial type of the invaders who brought Iron Age civilization to Scandinavia. Besides this clearly differentiated Nordic type, there seem, however, to be various submerged minority elements in the eastern Norwegian population which are not limited to any one district, but are diffuse throughout. One is a shorter, somewhat darker and less dolichocephalic element which may in part represent an aboriginal coastal population, but which may, to a greater extent, consist rather of racial elements brought from central Europe in solution by the Iron Age Nordic invaders. Some of it, again, is undoubtedly descended from the thrall population brought from many parts of western Europe by the

Vikings. The fact that it is shorter, darker, and less dolichocephalic than the more clearly designated Nordic type does not mean that it is very short, very round headed, or very dark.

Besides this submerged element, or medley of elements, which is extremely difficult to isolate, there is a third type, characterized especially by a broad face and a broad mandible, which may be attributed without question to recent Finnish influence. Finns settled here in the Grue district of Hedmark some 300 years ago, and have since been largely assimilated to Norwegian nationality and absorbed into the Norwegian population. Very few members of this colony still speak Finnish, or identify themselves as Finns.

On the whole, despite these influences, the eastern provinces of Norway form, apart perhaps from Sweden, the most characteristic concentration area of the central Nordic racial form in the world. This residual enclave is directly descended from the Iron Age Nordic population which once occupied an immense area on the plains of central and eastern Europe and western Siberia, and which elsewhere has been replaced, altered, or absorbed.

Western Norway, the next section under consideration, includes the provinces of Telemark, Aust-Agder, Vest-Agder, Rogaland, Hordaland, Sogn og-Fjordane, Bergen, and Møre. Within these provinces there are, in contrast to those farther east, considerable local differences; as a rule, many round-headed peoples live along the coast, while mesocephals predominate in the inland valleys.

In the province of Rogaland the brachycephalic element reaches its maximum and here, in fact, is located its center of greatest concentration in all Norway. The inner nucleus of this brachycephalic area is Jaeren,[37] a flat coastal plain, locally uniform in race, but regionally distinct. Here alone, in all of Norway, occur natural deposits of flint, and for this reason Jaeren must have been an important source of implement material for both Mesolithic and Neolithic peoples. On the plain the pre-Iron Age population must have been particularly dense.

In Jaeren, Arbo found 82 per cent of brachycephals,[38] a ratio as high as that usual in southern Germany, and a mean cephalic index of 83.2. The three other districts of Rogaland, by comparison, have mean indices of 81–82. The Jaeren people form, as a whole, a very definite and easily observed type which has been most fully described by Larsen.[39] This type is most concentrated in the parishes of Haaland, Høiland, Klepp, and

[37] Bryn and Schreiner, pp. 431–449. Arbo's and other previous studies are covered in this section.

[38] Arbo, using the Broca system of partitionment, included all indices of 80.1 and over, pooling Broca's sub-brachycephalic and brachycephalic classes.

[39] Larsen, C. F., *Om Jaedertypen.*

Time. It has a large cranial vault of medium height, very broad, and of considerable length. Individual cephalic indices go as high as 90 or more, but the mode for the type as a whole is 84. The occiput, nearly vertical, often shows a slight degree of flattening. The temporal bones are weakly curved, but the parietal tuberosities are strong. The forehead is broad, only slightly curved, and quite high, and usually of but little slope. The browridges are, on the whole, of moderate size. The head exhibits from above a roundish, oval form; it is not an evolved planoccipital skull, although individual crania have a tendency in this direction. The face is notable for its breadth, both between the zygomata and in the mandible, which is frequently heavy and deep. The nasal profile is usually straight, but in one case out of six it is concave. The chin is pronounced, and sometimes pointed. Together, the face and head give an impression of squareness, owing to the prominence of frontal and parietal tuberosities, and to the breadth of the face and jaw.

In pigmentation, these brachycephals are slightly less fair than the few dolichocephals found in the same region, but they are still predominantly blond. Eighty-one per cent have blue eyes, and only 3 per cent brown. Most of the hair is either light or medium brown; only 30 per cent have dark brown hair, and less than 2 per cent black.

Correlations within the Rogaland population prove little. The few dolichocephals are very little taller than the brachycephals, who are as tall as the eastern Norwegian Nordics, with a mean of 172 cm. Red hair and brown hair are associated with the highest cephalic index level, and the round-heads tend to have longer and heavier bodies, and broader and heavier faces, than the long heads. That the brachycephalic type in Jaeren is basically of light-mixed pigmentation is made especially clear by the fact that what few brunets there are in Rogaland run taller, longer-headed, and finer-nosed than the population as a whole. The Jaeren brachycephals, therefore, are not short and dark as often stated,[40] but are tall and predominantly light-mixed people with large heads. There is no question here of a short, dark, brachycephalic population having been absorbed into a Nordic body, since the brachycephalic group in Jaeren is numerically the principal one.

In Hordaland, north of Rogaland, one finds a continuation of the same contrast between coast and inland valleys which occurs farther south. The brachycephaly of Jaeren, which extends southwards into the two Agders, also stretches northward in an attenuated form into Mid-Hordaland, where it is gradually submerged in the mesocephalic population.

[40] Arbo, to whom this statement has often been attributed, stated merely that the Jaeren brachycephals were shorter and more brunet than their long-headed brethren. The differences are actually very slight.

Secondary nuclei of brachycephaly occur sporadically farther north, notably in Sunnfjord on the northern bank of the great Sogn fjord, and in the coastal districts and islands of Møre.

So great has been the interest in the coastal brachycephals of western Norway that the equal importance of the mesocephalic population living more typically in the inland valleys and mountains of this part of the country has been somewhat obscured. On the basis of the cephalic index alone, it would be easy to dismiss them as a transitional form between the Iron Age Nordics of the east and the Borreby type brachycephals of the coast, but a number of considerations make this disposal impossible. The western Norwegian mesocephals are taller, blonder, and larger headed than either of the two types mentioned. In these and in other respects, they form a special population of their own.

In many districts of these provinces mean recruit statures of 175 cm. have been recorded, with a record mean of 178 cm. in the Voss district of Hordaland. The cephalic index of 78 or 79, which is so constant here, is not a composite of dolichocephals and brachycephals, but represents a truly mesocephalic condition.

Mme. Schreiner, in order to study this special group in greater detail than the recruit material permits, selected the high mountain district of Valle in Setesdal, in the northern part of Aust-Agder; and also two isolated districts of Hordaland, Hålandsdal and Eidfjord.[41] Of these three, Valle yielded the largest series, and the most extreme local form of the population under consideration. This site was especially chosen because it is probably the most secluded, most conservative place in all Norway; its inhabitants are still living in many respects in the saga period, and mingle little with outsiders.

Valle was first settled in the second and third centuries of the present era, while a second wave of colonists arrived in the ninth. Since the dialect spoken in Valle is purely west Norwegian, we may assume that the present inhabitants represent a survival of that segment of the coastal population which, during the first millennium, forsook the shore for the mountains behind it.

In body measurements the Valle people are large, although the mean stature of 174.7 cm. for one hundred adult males is not the greatest in this region. The women, with a mean of 160.0 cm., are much smaller. The sex difference in height, as in many other features, is particularly great here, and much greater than in Norway as a whole; it totals 14.1 cm. in Valle, as against 10.0 cm. in the entire country. The Valle people are, as a rule, heavy boned, and like the rest of the population of which they are a part, longer and heavier bodied than members of the eastern Nordic type.

[41] Schreiner, A , *Valle, Hålandsdal, und Eidfjord.*

The mean head length of the Valle males reaches the extreme figure of 198 mm., considerably longer than that of the dolichocephalic eastern Norwegian Nordics; the breadth, 154.9 mm., is as great as that among many brachycephals, although in this case, in view of the exceptional head size, the resultant cephalic index mean is only 78.9. A mean head height of 125 mm. is, however, moderate. The face is large, with a mean nasion-menton height of 128.3 mm., and a bizygomatic breadth of 142.9 mm. The forehead and jaw are broader, likewise, than in most of Norway, with means of 106.6 and 109.2 mm.

By and large, the morphological observations bear out the impression of robusticity shown by the measurements; the forehead is often quite sloping, the browridges frequently heavy, the faces angular, the jaws firm and deep. In keeping with the cultural recessiveness of Valle, the palate and dental regions are large and primitive, in a mediaeval or Iron Age sense. The pigmentation is exclusively light or light mixed, for in Mme. Schreiner's sample which included one-fourth of the total population, not a single brown eye nor head of black or dark brown hair was discovered. Among the men, 90 per cent of pure and nearly pure light eyes were found, with but 3 per cent dark mixed; among the women, as is frequently the case elsewhere, the light-eyed category is smaller than that of the men by a full 10 per cent. In hair color the Valle males show 40 per cent of ash-blond, an equal number of various shades of brown, and the remaining 20 per cent of light golden blonds.

Mme. Schreiner, as well as Arbo thirty years earlier, considered that the Valle people represent a retarded sample of the Viking population which lived in western Norway a thousand years ago, and this conclusion is based on geographical and ethnological as much as on racial grounds. If this be true, and there seems little reason to dispute it, then we may at last have found the living counterparts of the Iron Age crania which might, in many respects, have been those of Upper Palaeolithic men. Historically we know that from the Neolithic onward no racial types could have entered this region except for a pre-Iron Age Borreby-Megalithic-Corded blend, and, later, the Iron Age Nordic race which we have already seen in the provinces to the east. Both Arbo and Mme. Schreiner detected a minor element in the Valle population which was smaller and finer boned, and which was presumably Nordic in the Iron Age sense.

The third section of Norway, usually designated as a racial center, is the north central group of three provinces, Møre, South Trøndelag, and North Trøndelag, with especial emphasis upon the two latter. The two Trøndelags include several great valleys: Namdal, Orkdal, Meldal, Galdal, and Tydal, and a number of large islands as well. To the south-east, this region is effectively blocked from contact with eastern Norway

by the Dovre Mountains. During the twelfth and thirteenth centuries, this was the most populous and most important part of Norway, in which was located Nidaros, the capital of the Norse kings. This region was a center of Norwegian aristocracy, and a base for extensive Viking expeditions. As a result of these voyages, the whole Trondhjem region must have received a relatively large influx of foreign slaves and thralls, while in some of the valleys, Saxons and Bohemians were especially imported as skilled laborers. Tyrker, the famous Rhineland German who discovered the grapes on Vinland and made the New World's first wine, was probably one of these immigrants.

The modern population of the Trøndelag region is notable in that it exceeds the rest of Norway in a number of important features. One is in stature, for the tallest provincial means are found here; another is in the height of the cranial vault, which reaches a mean of 128 mm.; a third is in the percentage of blue eyes, for this is the lightest-eyed region of Norway. The hair, by contrast, is by no means the blondest, but there are significant deficiencies of ash-blond, and excesses of golden and of brown. This type is also characterized by a considerable face length, with narrower bizygomatic and bigonial diameters than are found in Norway as a whole. The type which possesses the characters enumerated above is especially concentrated in South Trøndelag, and most strongly in the valley of Orkdal. The other districts of the two Trøndelags show a tendency for this special Nordic type to blend into the mesocephalic western form which reaches its culmination in Valle.

Bryn has compared the Trøndelagen people in observations with the eastern Norwegian Nordics, and his contrast here is as valid in most respects for the western Norwegian mesocephals as for the Trøndelagen people themselves, since the latter two are morphologically much alike.

The Trøndelagen population has the same proportion of dark hair as is found in the eastern Norwegian valleys; but differs from the classic Nordic type in a low ratio of ash-blond (26 per cent) and a correspondingly high proportion of golden and brown. The hair form in Trøndelagen is usually wavy; it is coarser, and more abundant on beard and body.

Although the Trøndelagens are the two lightest-eyed provinces in Norway, their commonest iris type is very light mixed (Martin 13–14) rather than pure blue. According to Bryn, the typical Trønder iris is close grained and opaque, for the fibers are dense and closely imbricated. Bryn contrasts this iris type with that of eastern Norway. The skin, while as light in color as that of the eastern Nordics, is coarser in texture and much tougher. As a result of this density of the integument, the bony and cartilaginous parts of the face do not stand out in fine relief.

The forehead of the special Trønder type is higher, broader, and much

less sloping, and the profiles of the forehead and nose are not parallel, but form a distinct broken angle. Frontal bosses, which do not appear in the Eastern Valley type, are frequently found, and the temporal region is fuller. The transitions from frontal to temporal and frontal to parietal regions are smooth and difficult to find, whereas with the eastern type they are clearly marked. The nose of the Trønder type, while equally high or higher, is typically straight or convex, with many wavy or undulating profile forms. The side walls are less steep, and the transition from bone to cartilage difficult to find without palpation. The tip is somewhat thicker, especially in old age, and the wings less compressed.

On the other hand, the zygomatic arches are less prominent than those of the eastern type. Not only are they somewhat more compressed, but, at the same time, the temporal region above them is broader and fuller, so that the lateral profile of the face falls usually in an unbroken sweep from the side of the head to the lower jaw line. As with the Eastern Valley type, the gonial angles are not noticeable. The cranium as a whole is shorter, higher, and more rounded, and the occiput less prominently curved. On the whole, the impression is given of a better filled, more rounded, and less angular head and face. If one leaves in the description of hair and integument, and adds a prominence of zygomata and of mandible, this description will apply to the other end type of the tall, mesocephalic population of western and central Norway, that of Valle.

In reviewing the data on the coastal and mountain population of western and north central Norway, from Aust-Agder to North Trøndelagen, we find ample evidence of the major survival of a pre-Iron Age population. Within this population at least three elements are seen.

(a) A tall, heavily built, large-headed type, with a stature of about 170–172 cm.; the cephalic index is about 84, which would correspond to 82 on the dry cranium; the face is broad, the jaw broad and heavy, the occiput often flattish, the skull square in appearance more frequently than round; the pigmentation is partly but not extremely blond, with light-mixed eyes, and hair which is medium brown to light brown on the golden side in the majority of cases.

(b) An extremely tall, somewhat slenderer type, with a stature of 174 cm.; mesocephalic, with a more moderate head size in length and breadth diameters, but with a vault attaining 128–130 mm. in auricular height, which is very great for living races; a long face, narrower in bizygomatic and bigonial widths than (a), and as narrow in these respects as that of Iron Age Nordics; heavier, with craggier facial features and thicker, coarser soft part anatomy than the Iron Age Nordics, in this respect approximating type (a); characterized in pigmentation by almost a totality of very light-mixed eyes, especially of the blue variety with a

minimum of yellow and brown spotting; and by a brown or golden-brown to golden hair color range.

(c) A type which in reference to (b) is equally tall, equally mesocephalic, but lower-vaulted and larger in length and breadth dimensions of the vault; equally long-faced, but wide in both malar and gonial diameters, heavy-jawed, large faced; similar in pigment characters to (b), but not, in all regions, equally blond; large-bodied, rugged, and large-boned, with a great sex difference in stature.

In all three of these, the later Iron Age Nordic element has blended. Despite this influence, type (a) in its concentrated form, as at Jaeren, seems to have reëmerged as what appears to be a faithful replica of the Borreby race in its various forms, while (b), a blend of Corded with (a) and with elements of glacial age, forms a special and very characteristic and historically important Nordic sub-type. In both (a) and (b) the Borreby element, which entered Norway from Denmark during the Neolithic, is probably more important than the local post-glacial race of Palaeolithic tradition, remnants of which are probably masked in both, but appear in strongest solution in (c). Individuals of type (c) may well recapitulate, in most essential features, Upper Palaeolithic Western European man.

In any case, the deviation of the western and north-central Norwegians from the standard eastern Norwegian form is indicative of the absorption of the latter by pre-food-producing Scandinavian strains, as well as by pre-Iron Age Corded blood. The oft-stated and overemphasized resemblance between the western Norwegians and central European Alpines reflects merely the common origin in the glacial period of Borreby and Alpine ancestors. The Alpines, however, have undergone modifications involving size reduction below the earlier form, while the Norwegian survivors have retained their ancestral dimensions.

For the purposes of classification, I propose to lump the types (b) and (c) together, using Bryn's name of Trønder type, to designate all tall, coarsely built, mesocephalic blonds who show a predominance of Corded and Upper Palaeolithic elements, in contrast to the classic, finer Nordic type. This lumping may be justified by the supposition that (b) and (c) form but local end types of a larger population in which both are present but less distinct.

The fourth Norwegian area which merits separate consideration is the Far North, including the provinces of Nordland, Troms, and Finnmark. In this region it is not the description and identification of a special type, but the interactions of several different ethnic elements, and their reactions to a rigorous environment, which are important. These elements are the Lapps, whom we have already discussed; the Kvaens, who are Finlanders

of late arrival and who will be discussed in a later section of this chapter; and the Norwegians, most of whom are recent immigrants from other parts of the kingdom.

At the beginning of the Norwegian historical period, Hålogaland, which included Nordland and the southern part of Troms up to Malangenfjord, was thickly settled with Norwegians who lived along the coast and especially on the islands, and whose ancestors had come up in open boats in order to carry on fishing. These prehistoric settlers came from Trøndelag, Møre, and also from more southerly parts of the country. In the ninth century, at the latest, Norwegians from Hålogaland sailed farther north to hunt walrus and to exchange goods with the Lapps. A number of them settled, and in the thirteenth century the whole coast of Finnmark had a scattered Norwegian population. In the sixteenth century, Finnmark contained at least 6000 Norwegians.

For the next three hundred years the Bergen merchants held a trade monopoly which prevented private enterprise, and destroyed the incentive for northward migration. Many of the earlier settlers returned southward, leaving a shortage of workers. In consequence of this, King Christian V sent a mixed company of thieves, prostitutes, and other undesirables to the north country from southern Norway and from Denmark, in order to reënforce the population of the fishing villages. In 1815, however, Norwegians began coming north in large numbers, most of them from the southern part of the kingdom. Up until the eighteenth century, fishing and trade were almost the only occupations, but about that time agriculture was begun in the broad valleys of Nordland and Troms, and, under the influence of the newer settlers from the south, it became an important economic factor.

During the fifty years which elapsed between 1869 and 1920, the population of the north country grew from fifty to ninety-eight thousand. That of Nordland increased 88 per cent, of Troms 92 per cent, and of Finnmark 102 per cent. The bulk of this increase was caused by the influx of Norwegians. In 1920 Norwegians or people who considered themselves Norwegians constituted 99 per cent of the population in Nordland, 89 per cent in Troms, and 61 per cent in Finnmark. Since these figures include, especially in Troms and Finnmark, a number of mixtures between Norwegians and Lapps, Kvaens, and both, the Norwegian population of these provinces deviates from the means of the kingdom in several respects, especially in a lowering of stature and a heightening of the cephalic index. Kvaen influence may be detected most clearly in an excessive breadth of face and mandible.

Norwegians of pure descent from immigrants born in the south-eastern provinces have retained their original stature and head form, as well as

their high incidence of ash-blond hair, but they have been modified through an increased bigonial breadth and a decreased minimum frontal diameter. Mme. Schreiner, who has studied with great diligence a large series of North Norwegians of all ancestries, suggests that this condition may be a result of environmental influences which have caused a thickening of the tympanic plate and the development of a palatal torus among most circumpolar peoples, including such varied groups as Eskimos, Lapps, and Icelanders.[42]

In studying the racial characters of the Norwegian people we have made use of a body of well-documented material, unique in Europe. By means of it we have been able to reconstruct a probable scheme of Norwegian racial history. There is one further source, however, which should not be overlooked, and that is the large corpus of Norse mythology and oral history. This source should not, as is commonly the case with folklore, be relegated to the ash-heap of what the scientist is wont to call mere literature, since a careful study of the social attitudes, descriptions, and events so well recorded in the saga material shows that these documents agree with and supplement the findings of archaeology and of physical anthropology. Two sources which, in this regard are of especial value are the Rigsthula lay of the *Poetic Edda*,[43] and the historical work of Snorre Sturlason,[44] a prominent political and scholastic figure in twelfth century Iceland.[45]

According to the Rigsthula, the social classes of the Norse people were begotten in a mythical and rather simple way. The early god Heimdal travelled about his domain in disguise, making use of the assumed name Rig. In this capacity he had sexual relations with three women, each of whom bore him children. The first woman gave birth to a brood of short, dark, and ugly offspring, who became thralls, and were relegated to agricultural toil and unskilled manual labor. The second produced the carls, large, healthy, red-faced, red-haired men, with big muscles, who became smiths and craftsmen, who performed skilled tasks, and who were also, in many cases, small land owners. The third woman was delivered of the jarls, the aristocrats, tall, lean men with blond hair and hard, cold, snake-like eyes, who fought and practiced the use of weapons, hunted, played games, and did no work.

The poet who described so vividly these three classes in the Norse population has given us a priceless picture of the people of Scandinavia during

[42] Hooton, E. A., **AJPA**, vol. 1, 1918, pp. 53–76.
Schreiner, A., *Die Nord-Norweger.*
Schreiner, K. E., *Zur Osteologie der Lappen*, vol. 1, pp. 161–177.
[43] Bellows, H. A., *Poetic Edda* (translation), pp. 201–216.
[44] Sturlason, Snorre, *Heimskringla*, edited by Erling Mousen, see esp. pp. 1–12.
[45] See also in this respect, Shetelig, Falk, and Gordon, *Scandinavian Archaeology.*

the pre-Christian Iron Age, as he saw them. The thralls, landless serfs, were, in part, prisoners brought to Scandinavia by the Norse seafarers, but this explanation cannot apply to the thrall class as a whole. A three class system was an old Nordic institution, common to most Indo-European-speaking peoples, and it is unlikely that the Iron Age invaders from central Europe had entered Scandinavia without their henchmen. Part, at least, of the thrall class must be considered the descendants of Danubians, Dinarics, and Alpines who were imported by their more aristocratic overlords, and who formed, in solution with Nordic, the lower class of the original population.

The carls find no ready counterpart in central Europe, and were probably largely indigenous, the Bronze Age prototypes of the peoples of Jaeren, Trøndelag, and Valle. The physical attributes of these carls are clearly contrasted with the more purely Nordic description of the jarls, who formed obviously the upper class of the Iron Age invading group, including many of the *bondi*, or free land owners without title, and who were apparently a numerous body.

Let us turn for a moment to consider the historical work of Snorre Sturlason. This erudite scholar deals with the gods as if they were men, and treats their mythical actions as history. His rationalization seems to have been uncannily accurate. In the first place, Asgard, the home of the gods, was a town on the northern shore of the Black Sea. These gods fought a people called the *vanir*, with whom they eventually agreed to exchange hostages. Odin, the king of the gods, agreed to take Frey and Freya, two of the *vanir*, and these were soon deified along with their hosts. The gods then left Asgard; and moved northwestward; they sojourned in Denmark, and passed without much ado into Sweden. This country became their main home, and Uppsala their chief center. Odin worship, which arose among their descendants, the kings and jarls, was centered especially in this neighborhood, and the worship of Frey and Freya as well.

Thor, who was a rough-and-tumble bucolic god, is little mentioned in this Asgardian history; he was apparently an earlier god and the especial deity of the coastal people of Norway. Odin was a sophisticated personage, wearing a finely woven blue cape and carrying an iron spear; Thor, who clothed himself in skins, carried a hammer as his weapon, and drove about in a goat-drawn chariot. If we grant that Odin was the chief god brought in by the Iron Age invaders, and surrounded with their classically-inspired trappings of luxury, then Thor was apparently the god of the older people, of the carl class, and he represents in his person and attributes a blend between the robust Mesolithic hunters and fishermen, and the Megalithic and Corded people. His association

with the last named is clearly shown by his devotion to the double-headed hammer, which was probably nothing more nor less than the boat-axe.

The worshippers of Odin and Frey were especially interested in the horse; horse sacrifices were made to these gods, and to Frey was dedicated the cult of the embalmed horse's penis. In Norway the horse was replaced to a certain extent as a funeral object by the ship; and the ships were made by the carls, who had learned their craft from their Megalithic predecessors and ancestors. With the introduction of iron, ship-building flourished, and the Viking was nothing more nor less than a sea-going central European Nordic, who had exchanged his horse for a steed suited to a new environment, with the coöperation of a vigorous body of indigenous craftsmen and warriors, into whose racial body his own group was soon blended.

(5) ICELAND

Iceland [46] was first discovered by the Irish, but when this event took place we do not know. Our first reliable account of their voyages to Iceland is the book of the Irish monk Dicuil, written in 825 A.D. At that time, and presumably for some years before, the only occupants of the island had been Irish hermits, who found their arctic retreat an excellent asylum from the ills of the world. It was probably from the Irish that the Norsemen obtained their knowledge of this island, before the motive had arrived for them to go there and live in it.

Toward the end of the ninth century King Harald Fairhair united Norway under his own command, and then tried to extend his authority to the Norsemen living in the Orkneys and other outlying regions. As a result of his activities the noblemen who refused to submit sailed forth on Viking expeditions, and the Norse population in the British Isles increased. Iceland, however, being a country which was practically uninhabited, offered a ready refuge to these political malcontents, who comprised, it is said, the highest nobility of Norway.

In 870 A.D. Ingolf Arnarsson first settled in Iceland, and a period of intensive colonization followed which lasted from 874 A.D. to 930 A.D. The high nobles, including kings, jarls, and peers of lesser rank, brought with them their entire households, consisting of wives, concubines, housecarls, and slaves. Four hundred such chiefs are mentioned in the *Landnamabok*, the unique document describing in detail the settlement of Iceland and the partitionment of its land. Various estimates reckon the population at the

[46] The bulk of this section is derived from Hannesson, G., *Körpermasse und Körperproportionen der Isländer*, and from Seltzer, C. C., *The Physical Anthropology of the Mediaeval Icelanders*, unpublished MS. in Peabody Museum. Author's permission.

year 950 A.D. between the figures of 20,000 and 50,000. The lower figure is probably more nearly correct than the higher. At any rate, the chances are that the servants and other undistinguished persons made up the majority, and that although the proportion of noblemen was high, it was not high enough to predominate in a numerical sense.

The *Landnamabok* names the homes of 1003 of these immigrants. Of them 846 came from Norway, 30 from Sweden, 1 from the Faroes, and 126 from the British Isles. Of those coming directly from Norway, the homes of 461 are known, as follows: Nordland, 51; Trøndelag and Møre, 95; Sogn og Fjordane, 128; Hordaland, 77; Rogaland 10 (3 from Jaeren); Agder, Telemark, Vestfold, 67; the eastern valleys, 33. Of 113 known homes in the British Isles, the list is: Ireland, 52, Scotland, 31, Hebrides, 26, and Orkneys, 4. Thus the Norsemen who came from Norway came mostly from the coastal regions, and especially from Hordaland, Sogn og Fjordane and points northward. Few were from the eastern valley region and fewer from the brachycephalic nucleus in Rogaland. Those from the British Isles were presumably Norse who had not occupied their new homes long enough to lose their Norwegian identity.

The Vikings who came from the British Isles brought with them Keltic-speaking slaves and concubines, who formed a considerable community and who are frequently mentioned in the sagas. Some of the leaders undoubtedly had Irish mothers. The exact ratio of these people to the total population is, however, a matter of controversy. Hannesson, who has measured the living Icelanders, estimates the Irish and other Keltic elements to have formed some 13 per cent of the whole. At any rate, since the tenth century no new immigrants have entered Iceland in any numbers, and hence the living Icelanders are the direct and unassimilated descendants of the Viking settlers and of their retainers.

In a total of 33 of the longer poems,[47] the bards who composed the sagas gave physical descriptions of 67 early Icelandic persons, all important and drawn mostly from the noble class. Of these 54 were called large or tall, and only 3 medium sized. In regard to hair quantity, 8 out of 9 men were said to have long hair, and one thick. Six out of seven men had curly hair, and one straight. The following hair colors were observed for 19 males: gray 2, white 1, golden blond 2, blond 3, red 3, light brown 1, brown 4, black 3. One female was given black hair. Of three beard colors noticed, two were red and one gray. One man had blue eyes, and two women black. Although these observations do not form a statistically valid series or a random sample, yet they may be regarded as ample proof that the ancestors of the Icelanders were of variable pigmentation. Since the persons described were all of high rank, the chances are that most of

[47] Heinzel, R., **SAWV**, vol. 97, 1881, p. 107.

them were pure Norwegians, and that the pigmentation map of western Norway was not very different a thousand years ago from what it is today.

The modern Icelanders, with a mean stature of 173.6 cm., are taller than most Norwegian groups, and come closest in general bulk to the Valle and Trøndelagen populations. In bodily proportions, too, they seem to be moderately thick-set and heavily muscled, and to be long spanned and relatively long bodied. In these general somatic characters they reveal the fact that their ancestors came more from the coast than from the interior of Norway.

Their heads, being very long, with a mean of 197.3 mm., and rather broad (154.1 mm.), may be duplicated in size only in Valle, and in Ireland. A head height of 126 mm. likewise fits into the general West Norwegian picture, as does a mean cephalic index of 78.1.

The Icelanders, with a nasion-menton height of 130.1 mm., are very long faced, but their excess over the Norwegians in this character is partly a matter of technique.[48] They are actually not much longer in this character than the people of Valle. The breadths of the face, the minimum frontal, bizygomatic, and bigonial (106.5, 140.6, and 108.5 mm.), are all broader than the corresponding dimensions in Norway as a whole, but they are comparable to those found in the provinces from which the Icelandic ancestors came. The excess of the jaw breadth over that of the forehead may indicate an adaptation resulting from rigorous dietary conditions,[49] as Mme. Schreiner also observed in northern Norway.[50] The noses are very high (58.8 mm.), and of moderate breadth, with a nasal index (60.2) on the lower border of leptorrhiny. One-half of the nasal profiles are straight, one-third concave; the remaining 17 per cent are mostly undulating, with a few convex. On the whole, less convexity is found here than in most districts of Norway or of Ireland.

Hannesson, although he used the Fischer chart, divides his hair color categories in such a way that one cannot distinguish the ash-blond from the golden class. Other evidence, however, clearly indicates that, of the two, the latter is in the majority. Of pure blond hair (Fisher #12–24) he finds but .8 per cent as against 13.1 per cent for Norway,[51] and 5.5 per cent from Sogn og Fjordane, the province from which the largest number of settlers to Iceland came. In his light brown class (Fischer #7–11, 25–26), which includes what other authorities usually call ash-blond, he finds 52 per cent

[48] In recruit material used in the *Somatologie* nasion is quite apparently located lower than is consistent with either Hannesson's or Mme. Schreiner's techniques. A series of Icelanders measured by Ribbing includes a face height mean of 122 mm.; cf. Ribbing, L., **LUA**, N. F. Afd. 2, vol. 8, #6, 1912, pp. 1–8.

[49] Hooton, E. A., **AJPA**, *loc. cit.*

[50] Schreiner, A., *Die Nord-Norweger.*

[51] Recalculated from Bryn and Schreiner.

of his series, as compared to 64.8 per cent for Norway and 59.8 per cent for Sogn og Fjordane.

Thus although the Icelanders are still prevailingly light haired, they are darker than any purely Norwegian population in Norway. In Norway black hair is everywhere, except among the Lapps, in a very small minority; in Iceland it rises to the figure of 9 per cent, while red hair accounts for 3 per cent more. The presence of these two colors in such quantities is an excellent indication of the persistance of a strong Irish strain.

This indication is strengthened by a study of Icelandic eye color. The ratio of light- and very light-mixed eyes (Martin #13–16) rises to 76 per cent, as high as the Trøndelagen ratios. But in Trøndelagen the majority are light-mixed eyes (Martin #13–14) while in Iceland, as in Ireland,[52] over half of all eyes are pure blue.

On the whole, the Icelanders represent a racial population which is most closely related to the mediaeval inhabitants of the western Norwegian coast, from Hordaland to Trøndelagen; they fit typologically into a midpoint between the two extremes of the Trønder category. They show certain developments of their own, particularly in their excessive face length, and in what seems to be an Arctic modification of the palate and jaws. In some respects they show perceptible Irish affinities; as in the retention of an excessive head size, and in the disharmony between very light eyes and hair of but intermediate blondness. In this series, even more than in the living Norwegian material, the resemblance to Upper Palaeolithic cranial and facial types is manifest.[53]

(6) SWEDEN[54]

Sweden, which occupies the more southerly, less mountainous, and larger side of the Scandinavian Peninsula, is in area the fifth largest country in Europe. Most of its land is of high economic utility, since the low, well-watered slope of southern and central Sweden, dotted with lakes, is well suited for agriculture, while in the north, large forests and plentiful mineral deposits furnish materials for industry. Since 1775 Sweden's population has grown from two to six millions, not including the million and a half who have emigrated to the United States. Much of this increase has been fostered by the growth of industrial life, especially in the mining areas and in the cities. Central Sweden, in a belt reaching southwestward

[52] See Chapter X, section 2.

[53] Seltzer, C. C., *op. cit.* Seltzer finds a Crô-Magnon-like type in a mediaeval cranial series from Haffiarderey, collected for the Peabody Museum by Vilhjalmur Stefansson. His opinion as to this resemblance is substantiated by both metrical and morphological comparisons.

[54] The principal sources for this section are:
Lundborg, H., and Linders, F. J., *The Racial Characters of the Swedish Nation.*
Retzius, G., and Fürst, C. M., *Anthropologia Suecica.*

from Stockholm, and the peninsula of Skåne, are the regions of thickest settlement. Most of the Swedes who have gone to the United States originated in Götaland, the southwestern part of the kingdom.

In prehistoric times, Sweden, although less populous than Denmark, was far more important than Norway. From Ancylus times until the beginning of the Iron Age, the southwestern portion opposite the Danish Islands was a center of cultural activity, while the central and northern parts of the country were conservative and rustic cultural outposts. The brachycephalic Mesolithic population so typical of the Danish islands was less firmly rooted in Sweden, and the successive invasions of Megalithic and Corded people passed over into Sweden relatively unaltered, and produced a greater proportionate effect upon the racial composition of this country than upon that of Denmark. The Corded people, especially, moved northward into the central portions of the kingdom, and probably entered Trøndelagen, where their racial type is still important, by the Swedish route.

The Iron Age invaders, the linguistic ancestors of the modern Scandinavians, again chose Sweden as their especial sphere of colonization, and settled here in greater numbers than in Denmark or in Norway. Sweden became a great breeding ground for Nordic peoples, chief worshippers of Odin and of Frey, and after less than a thousand years, the country became so crowded with them that overpopulation, coupled with the onset of an adverse climate, forced a huge mass exodus southward.

This movement was, in effect, the great series of Germanic migrations, the Völkerwanderung, which spread from Schleswig-Holstein and the Low Countries, on the west, and from the mouth of the Vistula on the east. The Goths, the Burgundians, and the Vandals, except for the Franks and Saxons, the most numerous and most important tribes of Germans, all had their origins in Sweden. As a womb of peoples Sweden was more important than Norway, and at an earlier date. Sweden was, in fact, to the continental world what Norway was to Britain, Iceland, and Normandy.

Although, since the Iron Age, Sweden's historical rôle has been that of a feeder of peoples, she has at various times, and to a lesser extent, acted in the opposite capacity. During the Völkerwanderung the remnants of the Herulians and various bands of disappointed Goths returned to the Nordic homelands, tired of wandering, and it is not unlikely that they brought with them new racial elements picked up in Hungary and in the lands north of the Black Sea. Later on, during the Viking period of the ninth to eleventh centuries, Swedes, as well as Danes and Norwegians, raided many countries and brought back with them thralls from the British Isles, France, and the lands across the Baltic. According to Nordenstreng [55]

[55] Nordenstreng, G., *Origin, Growth, and Racial Components of the Swedish Nation*, in Lundborg and Linders, pp. 41–49. Special ref. to p. 44.

these prisoners were settled most commonly in the present county of Uppland, immediately north of the city of Stockholm.

The development of cities in Sweden drew to that country large numbers of traders and merchants, from Viking times onward, and these commercial people were largely of Germanic origin. Frisian and Saxon chapmen were the first, and these were followed by others, in later times, from various parts of Germany, including the southern principalities. During the period of Sweden's great military expansion (1611–1718 A.D.), when the kingdom extended over large parts of Germany, many Germans were made noblemen, and went to live in Sweden. Thus the German blood in Sweden is a factor to be reckoned with, and has influenced, chiefly, the city population and the nobility. The latter class has also received strong infusions from Scotland, for Scotsmen, who served under Gustavus Adolphus in large numbers, were in many instances rewarded for their bravery by elevation to the Swedish peerage. Furthermore, Walloons, who represented a much darker and rounder-headed racial element than these other immigrants, were brought to Sweden during the seventeenth century to work in the iron foundries. Some thirty or forty thousand of their descendants can still be identified.

More important than any of these absorptions, in all likelihood, has been the influence of the Finns upon the Swedish people. In the Middle Ages, Kvaens wandered into the northern counties, but not in great numbers. The same Kvaenish migration which affected the northern provinces of Norway from 1700 A.D. onward, also reënforced this element in northern Sweden. During the sixteenth and seventeenth centuries, other Finns settled in Värmland and Dalarne, counties bordering on the Norwegian provinces of Ostfold and Hedmark, and the Finns of Grue [56] in Norway came as part of this same migration. Other Finns remained in scattered settlements between the Värmland and Dalarne nucleus and the head of the Gulf of Bothnia, while still others penetrated as far south as Stockholm.

Although this migration ceased about 1700, over 13,000 Finns had come to Sweden and to a small district in Norway. Although these Finns were not numerous, the population of Sweden at that time was no more than one and a half millions, and the Finns were particularly prolific. Today only two villages in Värmland retain Finnish speech from the time of this migration. In Norrbotten, in the valleys of Torne and Muonio, more recent colonies of Finns, from southwestern Finland, still speak their own language, and form a distinct alien bloc. In all there are, at present, about 30,000 Finnish speakers in Sweden, in addition to whom it is estimated that well over 100,000 Swedes are at least partially of Finnish descent.

[56] See p. 313.

In comparison with most European countries, Sweden has, in post-Iron Age times, been subjected to remarkably few foreign influences which would affect her racial composition. Despite the absorptions and immigrations noted above, Sweden remains one of the most homogeneous nations in Europe both in race and in pedigree. This homogeneity is largely the result of geography, for in contrast to the rugged Norwegian landscape, with its mountains and fjords and distinct centers of racial concentration, the flat surface of Sweden, with its modern industrial development and fluidity of population, has brought about a striking racial unity. In Sweden social and occupational differences in physical type are almost as great as regional ones. In no racial character are Swedish sub-groups, whether geographical or social, strongly differentiated.

The same basic Hallstatt Nordic type which found such a favorable breeding ground in Sweden during the Iron Age is still the predominant race in that kingdom. It has absorbed into its ethnic body both older and newer peoples, and has spread the resultant blend with remarkable evenness over the surface of the nation. On the whole, Sweden is the most Nordic nation in Europe in the Iron Age sense, and it is much more Nordic than Norway. At the same time, owing to geographical factors again, the valleys of southeastern Norway contain as unaltered an Iron Age Nordic population as any in Sweden. The metrical characters of the recruit material for the entire Swedish nation are very similar, in fact, to those of the southeastern Norwegians.[57] The stature mean of the Swedes is 172.2 cm., and their characteristic bodily proportions are equally close to the Norwegian standard. Regional variation in stature stretches only from 169.9 cm. in the northeastern manufacturing districts to 172.5 cm. in the central provinces contiguous with Trøndelag. In the far north, where Finnish influence is common, and in the south, where the older, more brachycephalic populations of the Neolithic and Bronze Ages were seated, the length of the trunk is relatively greater, and of the legs smaller, than in the central parts of the kingdom, but these regional differences are less pronounced than those between social and occupational groups in the nation as a whole. As in Norway, the population drawn to the cities is notably shorter-armed than that which remains upon the land.

The mean head length of Swedish recruits is 193.8 mm., and the breadth 152.3 mm., yielding a cephalic index of 77.7. The longest heads, with regional means running up to 195 mm., are found in the west, over against Norway, and the shortest in the north. The lowest cephalic index mean is 76.7, and the highest, concentrated in the north, are all below 80. The three principal breadth diameters of the face, minimum frontal, bizygomatic, and bigonial, have national means of 104.6 mm., 136.0 mm.,

[57] Lundborg and Linders, *op. cit.*

and 103.4 mm., respectively, all of which are typically Nordic and comparable to those of the eastern valley Norwegians. Slight regional differences place the narrowest foreheads and faces in the western counties, and the broadest in the north and south. The total face height of 126.6 mm. is again a typically Nordic mean, comparable to that obtained by Bryn in his later work on the Eastern Valley people.[58] While the narrowest faces are found in western Sweden, as is to be expected, the longest are typical of farmers in the north, where the Corded element may be slightly more prevalent. The Swedes are typically leptorrhine,[59] and the commonest nasal profile form is straight. Concave noses, which reach the rather high figure of 28 per cent in the kingdom, are commonest in the north and least frequent in the south.

According to the *Anthropologia Suecica*, 52 per cent of Swedes had ash-blond hair, and 23 per cent golden. Thus the proportions of these two classes of blondism are reversed in comparison to Norway. The two countries are about equal in amount of dark hair shades, but, by and large, Norway would seem to be lighter haired than Sweden,[60] if we may rely upon a comparison based on a correlation of two scales. In any case, the most numerous category is a medium to light brown, with extreme blonds in the minority. Regional differences, though slight, are suggestive. Götaland, the Goth country, as southern and southwestern Sweden was anciently designated, is lighter than Svealand, or central Sweden; Norrland, the north country, is in turn the darkest. The most red hair is found in the west and south, and the least in the east, toward Finland.

Retzius and Fürst found 67 per cent of light eyes, 29 per cent of mixed,

[58] Bryn, H., **AAnz,** vol. 9, 1932, pp. 141–164. It is higher than the Norwegian recruit material means, which were apparently taken with a different technique.

[59] The only nasal constants in the L. and L. material are for Skaraborgs län, where a N. I. of 62.7 is found. The nasal dimensions of 61.37 mm. for height and 30.18 for breadth (p. 102) are presumably misprints.

[60] This statement is in direct contradiction to the opinion of most anthropologists, especially of W. Scheidt, as expressed in his *Die rassischen Verhältnisse in Nordeuropa*, (**ZFMA,** vol. 28, 1930, pp. 1–198) and is by no means certain It is based on the following correlation of the L. and L. material with that from the *Somatologie der Norweger:*

Fischer Nos.	Designation	Sweden	Norway
12–25	flaxen	6.9%	27.9%
7–11, 26	light brown	62.5	50.0
5–6	brown (medium)	25.1	17.2
4	brownish black	2.0	3.7
27–28	black	.2	.1
1–3	red	3.3	1.3

The Swedish recruits were observed for hair color by means of a local chart, which was later correlated with the Fischer standard. (L. & L., p. 10.) The comparison between the Swedish and Norwegian results was made by recombining the total Norwegian series according to the Swedish divisions. The difference in amounts of red is undoubtedly due to a difference of standards, as Conitzer has previously stated. (Conitzer, H., **ZFMA,** vol. 19, 1931, pp. 83–147.)

and 4 per cent of dark. In the first category were presumably included light eyes with a slight spotting, as in the Martin numbers 13 and 14. The Lundborg and Linders study, made with a different observational scheme,[61] raised the first category to 87 per cent, and the third to 5 per cent. In any case, there can be no doubt that the eye colors of the Swedish people are predominantly light mixed and light, as in Norway; and that the lightest eyes in the kingdom are found in western Sweden, and the darkest in the north.

Correlations within the Lundborg and Linders series of 47,000 men show certain slight linkages, which could be dismissed as insignificant if found on smaller samples. The cephalic index decreases slightly, and the facial index rises, with an increase in stature; similarly, the tallest statures have a tendency to go with brown hair and light eyes. It is not unreasonable to suppose that this combination may be a faint reflection of the absorption of a Corded racial element into the population of Sweden. In the same way an association of flaxen hair, moderate stature, mesocephalic head form, and convexity of nasal profile, makes it unlikely that all high cephalic indices in Sweden are due to East Baltic influence, and suggests rather a survival of mesocephalic and brachycephalic elements in southern Sweden, comparable to those in western Norway. Truly short stature, linked with dark pigmentation and round head form, furnishes an infrequent combination, but one which may imply a Lappish strain in the far north, submerged Alpine elements, or both.

The Swedish material, and especially the correlations, confirms the opinion formed in Norway, that the Nordic race as such is not and was never wholly blond. The characteristic eye color is blue or gray, and the presence or absence of a small amount of superficial iris pigment seems racially irrelevant. At the same time, it is likely that all hair color shades from a light medium brown to the lightest, whether on the ashen or golden side, should be considered as "pure" lights, since, as the Swedish material shows, persons having these shades on the head have, as a rule, the same colored pubic hair. In Sweden, as in Norway, what linkages there are which point to the survival or resegregation of a Corded type indicate that this type was characterized by exceptionally light eyes, but a predominantly brown shade of hair.

Abundant anthropometric data from Sweden make it clear that the basic, and by far the most numerous element in the population is, as in eastern Norway, an Iron Age Nordic one, transferred from its central and eastern European home; earlier elements have survived less here than in

[61] " #1 = light iris (blue, gray, pale yellow, or green), also light iris with insignificant brown spots, points, or patches; 2 = mixed iris and light iris with brown aureole; 3 = light brown or dark iris." L. & L., p. 10.

Norway. There is, however, a strong concentration of unreduced Brünn and Borreby types, as illustrated in plates 4 and 5, in the fishing and seafaring population of the southwestern coast, across from Denmark; the presence of these types, although not clearly indicated by existing surveys, cannot, nevertheless, be denied.

At the same time, Corded elements within the Nordic racial body are most evident in the north, and especially near the Norwegian provinces of Trøndelagen. Lappish influences are also to be felt in the far north, while modern Finnish invasions and infiltrations have introduced the East Baltic type into central Sweden in some numbers. The nature of this type need not be discussed here, but will be studied in later sections of the present chapter.

(7) DENMARK[62]

Denmark, the smallest and most southerly of the three Scandinavian kingdoms, is also the most densely populated, being inhabited by two and one half millions of people. It consists of the peninsula of Jutland, the isthmus of Schleswig, acquired since the World War, and the Danish archipelago. These islands, the largest of which are Zealand, Funen, Laaland, Falster, Möen, Langeland, and Samsø, although smaller in total area than the mainland, contain the bulk of the population. The island of Bornholm, situated to the southeast of Skåne, is likewise Danish territory, as are the islands of Lessö and Anholt, which lie in the midst of the Cattegat. On the southwestern coast of Denmark the Frisian Islands begin their chain, which is only broken by the mouth of the Elbe in its stretch from Denmark to Holland. Some of these islands are Danish, some are German, and others are Dutch in nationality. Far separated from Denmark, but under its sovereignty, lie the Faroe Islands, between the Shetlands and Iceland, and Iceland itself is an autonomous state under the Danish crown, while Greenland, a restricted crown colony, is the home of a few thousand Danes.

Throughout the prehistoric period Denmark was the cultural center of

[62] The principal sources for the physical anthropology of the living in Denmark are:
Bardenfleth, K. S., **MODA,** vol. 3, 1929, pp. 3–49.
Burrau, C., **MODA,** vol. 1, 1907–11, pp. 243–260, 277–284.
Hanïesson, G., *op. cit.*
Hansen, Andreas M., **NMN,** vol. 53, pp. 202–266.
Hansen, Søren, **MODA,** vol. 1, 1907–11, pp. 69–81, 204–220, 222–240, 287–307; vol. 2, 1920–28, pp. 363–389.
Hansen, Søren, and Topinard, P., **RDAP,** vol. 3, 1888, pp. 39–41.
Heiberg, P., **MODA,** vol. 2, 1920–28, pp. 296–300, 353–360.
Mackenprang, E., **MODA,** vol. 1, 1907–11, pp. 11–68.
Ribbing, L., **MODA,** vol. 1, 1907–11, pp. 193–202.
Steensby, H. P., **MODA,** vol. 1, 1907–11, pp. 85–148.
Westergaard, H., **MODA,** vol. 1, 1907–11, pp. 353–391.

Scandinavia, and likewise the center of greatest population. The profusion of Neolithic and Bronze Age monuments and graves shows that before the Iron Age invasions both the mainland and the islands were densely inhabited; in view of this crowding, it is not surprising that the newcomers found greater room for expansion in Sweden and eastern Norway. From Ertebølle times onward the Danish Islands, and to a lesser extent the mainland, was the focal point in northern Europe for the settlement of the brachycephalic Borreby people. With them had mingled Megalithic seafarers in large numbers, while the Corded people had concentrated their activities on the mainland. It is not surprising; therefore, that a population so firmly attached to its milieu as that of pre-Iron Age Denmark should have survived the vicissitudes of centuries and eventually have reëmerged in considerable strength. That this is exactly what has happened is the sense of the present section.

During the Iron Age Denmark continued in its cultural leadership of Scandinavia, owing largely to its greater proximity to the source of civilized influences farther south, for Denmark was greatly affected by the repercussions of Roman civilization. In the Völkerwanderung period, Denmark, furthermore, contributed heavily to the stream of migration southward; the Cimbri, the first Germanic people to come under the eyes of Rome, were natives of Jutland; the Jutes and the Angles who settled England with the Saxons from Schleswig-Holstein again came from Denmark. The later inroads of Danes into Britain strengthened the earlier contingents. Hence, Denmark played an even greater part in the settlement of the British Isles than did Norway.

In contrast to Norway and Sweden, existing documents which cover the physical anthropology of the living Danes are scattered and incomplete. It is not possible to study the distribution of characters from village to village and county to county, nor to examine the special racial attributes of individuals. It is possible, however, to make a few general observations, and to supplement these with deductions based on common knowledge. In the first place, the Danes are not as tall as the Swedes and Norwegians, although their king is the tallest monarch in Europe. The mean stature of twenty-one year old recruits in 1925 was 169.4 cm., which varied between 172.3 cm., on the island of Anholt in the middle of the Cattegat, and 167.1 cm. for Fanø, the northernmost of the Frisian Isles. In general, Jutland and Schleswig are comparatively tall, with mean statures of 170 cm., while the island population is a centimeter or two shorter, especially on Samsø, southern and eastern Zealand, Laaland, Falster, and Möen. Copenhagen and the adjoining counties of northern Zealand are, by contrast, quite tall.

Aside from stature, there is no metric character in which all of Denmark

has been regionally studied. In other measurements and indices one is obliged to refer to material which covers the country as a unit, or certain sections of it only. Data referring to bodily build indicate that the Danes are longer armed, wider spanned, longer trunked, and, in general, more heavily built than the common run of other Scandinavians, and resemble in these respects the western Norwegians more than any other group. Several series show that the mean head lengths of Danes in various parts of the kingdom are uniformly 194 mm., as long as the Swedish national mean, and comparable to that of the mesocephalic population of western Norway; variations in cephalic index are dependent rather upon variations in head breadth, which ranges from 154.7 mm. on the island of Bornholm to 158.8 mm. in the northern part of Samsø. That the higher cephalic indices in Denmark result from greater breadths instead of from lesser lengths, is a sure indication that we are dealing with a Borreby form of brachycephaly.

The mean cephalic index of Denmark, however, is but 80.6;[63] and this sub-brachycephalic mean condition is not subject to much regional variation. Although Denmark is the least long headed of the three Scandinavian kingdoms, nowhere in it may be found a regional population as round headed as that of Jaeren. Denmark, like Sweden, is flat and lacks natural barriers; one must expect a great national uniformity. The highest means yet recorded are 81.8 for northern Samsø, 81.4 for western Jutland, and for the isle of Anholt. No regional mean is under 80.

Facial measurements on Danes are extremely rare; what there are show breadth diameters high for Scandinavia. Hannesson, in a small series of Danish sailors, finds a minimum frontal of 106.5 mm., a bizygomatic of 139.5 mm., and a bigonial of 107 mm. In northern Samsø, an unusually brachycephalic area, the bizygomatic rises to 142.5 mm. Thus the Danish facial breadths resemble those found in coastal Norway, especially the rounder-headed districts, and in Iceland.

Data on the hair and eye color of Danes is as extensive as that on stature, and covers the entire kingdom. Although no scales were used, the categories employed seem clearly defined and there can be little doubt as to the character of Danish pigmentation. Hansen found that "fair" hair decreased from 52 per cent at the age of 6 years to 33 per cent at 14, and fell to 16.6 per cent at the recruit age of 20 years. This "fair" category must, therefore, include pronounced degrees of blondism only, and exclude the light brown hues often designated as blond elsewhere. On the island of Samsø Bardenfleth found only 7.5 per cent of hair which he was willing to call light, and 40 per cent of medium, 43 per cent of dark, and 9 per cent of black. Samsø is one of the darkest-haired regions of Denmark.

[63] Hansen has 80.6, Burrau 80.69.

Judging from the distribution of the school children material, the southern part of the Danish mainland, toward Schleswig-Holstein, is the blondest section of the country; two regions are darkest: Thirsted, the northwestern county of Jutland, and the islands.

What appears to be the most accurate division of eye colors is that of Bardenfleth, who finds 38 per cent of light, 59 per cent of mixed, and 3 per cent of dark eyes on Samsø. This is comparable to the eye color situation elsewhere in Scandinavia. Samsø is one of the darker-eyed sections of Denmark, and regional eye color variations, though not great, follow those of hair color.

In its available form, the Danish material is not so arranged that many correlations and regressions can be made from it. In Samsø, light-haired individuals are a half centimeter taller than dark-haired ones, and slightly higher in cephalic index. This regression runs counter to the slight geographical association between darker hair, shorter stature, and rounder heads, from which racial inferences have been deduced. The associations noted in Samsø, however, agree with the similar correlations found in southern Sweden, which would point to the presence on both sides of the Cattegat of a special tall, blond brachycephal, particularly common among Swedish immigrants to the United States where the vulgar term "square-head" is used to designate it. Popular, subjective labels in the designation of races, used among persons ignorant of the existence of physical anthropology, are often truer than the hesitant results of erudite wanderings in the labyrinth of numbers.

A knowledge of the racial history of Denmark, and a familiarity with the appearance of modern Danes, makes the interpretation of existing data, however fragmentary, possible. On the whole, the Danes form, as Burrau feels, a composite type which is inextricably blended, but which shows in individual variations leanings toward different ancestral forms, as well as toward new combinations. The blond "square-head" noted above is an important type, heavy-boned and sturdy, basically Borreby in inspiration.

The minority of brunet pigmentation, in Denmark not associated with brachycephaly, reminds one that the Danish Islands held the greatest concentration of Megalithic people in the whole north, and that these Megalithic people blended with the Borreby aborigines before the arrival of either Corded folk or Iron Age Nordics. On the whole, Denmark, like Sweden and Norway, may be called a Nordic country, but Nordic only in the modern Scandinavian sense.

Before leaving the description of the living Danish people, two special problems remain, the racial character of the island of Bornholm, to the east of Denmark proper in the Baltic, and that of the Faroes. Ribbing, in a study of the Bornholm people, finds them taller, fairer, and somewhat

longer headed than most of the Danes, and considers that they are most closely related to the southern Swedes inhabiting the island of Gotland.

The Faroes, isolated in the northern seas between the Shetlands and Iceland, preserve a picturesque and mediaeval Danish population of fishermen.[64] These islands were first inhabited by the Scotch, who may or may not have left before the coming of the Vikings, which took place shortly before the settlement of Iceland. The Faroe males are as tall as Danes (169–170 cm.), and about the same in head form. (C. I.—79.6.)[65] The faces are distinguished by a considerable breadth of the mandible,[66] found also in Iceland and among the northernmost Norwegians. Until more extensive information appears than that at present available, we may consider the Faroe Islanders typical descendants of Viking Age Danes and coastal Norwegians.

In all three Scandinavian kingdoms, changes have been observed in stature during the last century. The normal amount of increase in young men draughted for recruiting has been somewhere between 6 and 8 cm. It would appear that one hundred years ago Danes of military age were only 164 cm. tall, on the average, while Swedes and Norwegians varied regionally between 166 and 168 cm. If one recalls the statures of the inhabitants of these countries before and during the pre-Christian Iron Age, it will at once appear that this increase has been actually a process of returning, under new stimuli, to an older condition. The depletion of these countries during the Völkerwanderung and the adverse climatic conditions of the Middle Ages must have had in the first instance a selective, in the second a depressing, effect upon national stature.

In all three countries comparisons between city and country populations show that there is a tendency for the Iron Age Nordic type to be drawn to the cities, and to be, in general, the most restless element in the population; undoubtedly because it was the last to arrive and because it formed in many regions the upper social stratum. For these reasons again it is not

[64] Chief works on the Faroes are:

Annandale, N., **TRSE,** vol. 25, 1906, pp. 2–24. Arbo, C. O. E., **DGT,** vol. 12, 1893–94, pp. 7–14.

Hansen, Søren, **JRAI,** vol. 42, 1912, pp. 485–492; **DGT,** vol. 21, 1912, pp. 251–256; vol. 25, 1920, pp. 53–54.

[65] Considerable confusion is extant concerning the head form and stature of the Faroe Islanders. Arbo (1893) measured a series of 20 men from the northernmost and 20 others from the southernmost island. He found that the stature and C. I. of the first group were 169.5 cm. and 75.2; of the second, 165.2 cm. and 83.2. His series of 60 men from Thorshavn fell into an intermediate position, approximating the means above given. These latter are taken from Hansen's series of 493 males from Suderø, and from Arbo's Thorshavn series. The startling regional differences of Arbo's work may be attributed partly to the small size of his samples, partly to the chance selection of isolated family groups.

[66] Annandale's mean bigonial diameter on 20 men is 111.8 mm.

inconceivable that the Völkerwanderung drained off this element in disproportionate numbers, and that the reëmergence of older forms has been a result of this process, especially in Denmark, in western Norway, and in southern Sweden, where the older forms were originally most numerous. The three Scandinavian kingdoms, and especially eastern Norway and Sweden as a whole, remain the greatest single reservoir of the Iron Age Nordic race, but it is conceivable that that race was numerically more important in Scandinavia at the time of Christ than it is today.

(8) THE FINNO-UGRIANS, INTRODUCTION

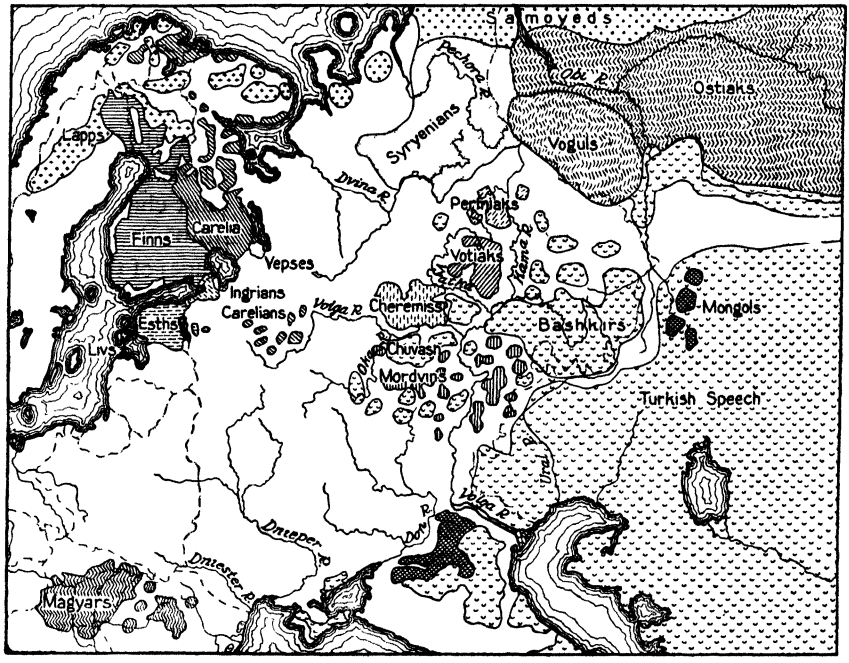
The next step in our survey of the living peoples of northern Europe leads us from Scandinavia, the present Nordic homeland, across the Baltic Sea to the countries in which the East Baltic race is most characteristic; the four republics of Finland, Esthonia, Latvia, and Lithuania. We propose to study first the two northernmost, in which languages of the Finno-Ugrian family are spoken. But this will be done in a roundabout fashion, since before the racial history of the Baltic Finns may be fully understood, it will be necessary to deal with the entire ethnic and linguistic group of which they form a part. For this reason it will also be necessary to interrupt the geographical order tentatively followed, and to start with the Finnish homelands in eastern Russia. In an earlier chapter (Chapter VII, section 1), a survey was made of the skeletal remains of early Finno-Ugrian-speaking peoples of this region; some mention was also made concerning their early ethnic movements. It is the purpose of the present section to explain in a little more detail the linguistic and historic relationships of modern Finno-Ugrian-speaking peoples.[67]

For the sake of clarity, we will repeat that Finno-Ugrian, along with Samoyedic, forms the Uralic linguistic stock or sub-stock which may or may not be united with Turkic, Tungusic, and Mongolian in a Ural-Altaic superstock. It is now believed that early Finno-Ugrian was one of the two elements which blended to form basic Indo-European.[68] Although today their use is not as extensive as that of Indo-European, modern Finno-Ugrian languages are by no means archaic, and show no tendency toward disappearance. They are, in fact, spoken by a large number of peoples, living under extremely variable environmental and cultural conditions, and scattered over a wide expanse of territory. In three nations,

[67] Useful sources are:
Atlas of Finland, 1925, esp. Wichman, Y., pp. 19–22.
Jochelson, W., *The Peoples of Asiatic Russia*, esp. pp. 16–21.
Sirelius, U. T., *The Genealogy of the Finns.*
Zolotarev, D. A., *Etnicheskiĭ Sostav Nasaleniĭa Sev.-Zap. Oblasti i Karel'skoĭ* **ASSR;** *ibid.*, **TKIP,** vol. 15, #2, 1928, pp. 1–26.

[68] See Chapter VI, sections 1 and 8, Chapter VII, sections 1 and 3.

Finland, Esthonia, and Hungary, divisions of Finno-Ugrian are the official languages, spoken by millions of people. In western Siberia, as well as in these countries, Finno-Ugrian speech occupies a large space on the map, but in this wilderness of forest and swamp it is actually spoken by very few persons. Elsewhere, throughout eastern central Russia and



MAP 10

THE DISTRIBUTION OF URALIC AND ALTAIC SPEECH ON EUROPEAN SOIL

This does not include Osmanli Turkish as spoken in the former Turkish Empire. All Turkish speech is represented by crescents, Mongols by cross-hatching, and Samoyedic by small circles. Finno-Ugrian is represented by various types of lines and stipples, except for Lappish, which is indicated by crosses, and Livonian, which is solid. The northern instances of Carelian are Kvaenish.

thence in a narrow band across to the mouth of the Gulf of Finland, it is found in little islands standing out in the midst of Slavic territory.

Linguistic affiliations within the stock may best be illustrated by Kajava's chart, reproduced in slightly altered form below.[69] In this chart the term *Ingrians* is used to include the various groups of Finnic speakers native to the Leningrad region; namely, the Vodes, the Lyds or Ijores, and the

[69] Kajava, Y., **EA**, #8, #9, 1922, pp. 353–358.

two tribes called Evremeiset and Savakot, who live among Russians in the city of Leningrad itself.[70]

The early home of the united Finno-Ugrians is supposed by linguists to have been in the region which extends from the headwaters of the Dnieper and the western Dvina to the western slope of the Ural Mountains. The country around the Oka, the bend of the Volga, and the Kama are thought to have been occupied by Finno-Ugrians by the time that some of their southeastern tribes mingled with Caucasic-speaking peoples to produce Indo-European.

In their early home, during the first millennium B.C.,[71] the Finns were in contact, on their southern flank, with the Scythians, who lived west of the

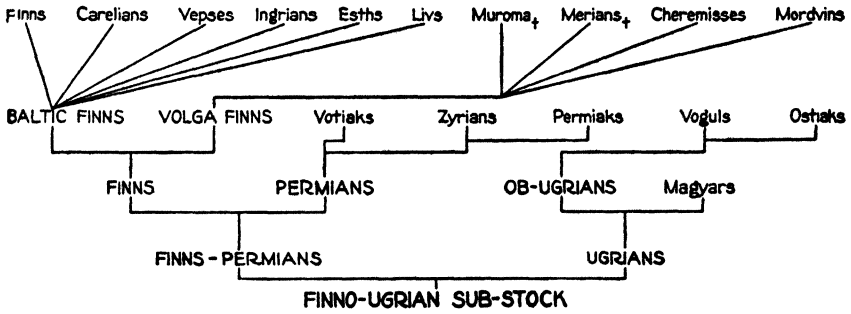


FIG. 31. LINGUISTIC RELATIONSHIPS OF FINNO-UGRIAN SPEAKING PEOPLES.
After Kajava, Y., **EA**, #8, #9, 1922, pp. 353–358.

Don, and with the Sarmatians, who occupied the plains to the east of it. Baltic peoples seem to have touched them on the west, for Baltic words are in use among Mordvins, who have never been near the sea. In the time of the earliest Greek accounts, Finns seem to have occupied all of the country which stretched from the Polessje district of White Russia to the central and lower reaches of the Volga. Herodotus located a people called Budinoi in the eastern part of this region, presumably in the Volga country; west of them he placed the Androphagoi, then the Melancheles (Black Mantles), and in the very west, the Neuroi. The name *Androphagoi* or Cannibals, has the same meaning as the Iranian word *Mord-Chvar*, whence are derived *Mordva* and our own term, Mordvin. The black mantle to which Herodotus referred is still a part of the national costume of the Volga Finns.

During the centuries immediately preceding the Christian era, the ancestors of the Baltic Finns migrated westward from their original home

[70] The Ijores number roughly 11,000, the Vodes about 700. Exact figures for the Evremeiset and Savakot have not been obtained.

[71] The chief source for the following historical résumé is Bunak, V., **ZFMA**, vol. 30, 1932, pp. 441–503.

to the eastern shore of the Baltic, south of the Gulf of Finland, where they occupied the country north of the Düna and the northern half, at least, of Kurland, thus taking over most of what is now Latvia, as well as Esthonia. After the beginning of the Christian era, some of them crossed the Gulf of Finland and settled near Åbo and in the Kokemäki and Kyrö valleys of the present Finland. This country was already inhabited by an Iron Age population, of Scandinavian cultural affinity, which the Finns completely absorbed. The invaders gradually spread eastward until, about 700 A.D., they reached the present Carelia. Thence they went to southern Savo, which seems to have been permanently occupied by 1000 A.D. From there on the occupation of Finland spread gradually northward until eventually the Finns spilled over into Sweden, as related in an earlier section. The Finnish penetration of parts of Sweden was only one-half of a reciprocal action, however, for even earlier, in the thirteenth century, the Swedes, coming by sea, made crusades against the Finns, and many Swedes remained on the eastern shores of the Gulf of Bothnia and the northern shore of the Gulf of Finland. It was at this period that the migration began which gave Finland her present Swedish coastal population. Meanwhile the ancestors of the Baltic-speaking Letts had moved northward into Kurland and Livonia, partly forcing the more southerly Baltic Finns out of what is now Latvia, and partly absorbing them.

Between Leningrad and the Finnish homeland may be seen the remnants of the early migrant groups, who, when the Slavs first appeared, between the sixth and eighth centuries A.D., formed a continuous belt of Finnish-speaking peoples. Nearest the Gulf are the Vodes and Ijores, and the Leningrad tribes; on the shores of Lake Onega and the headwaters of the Oyat River live the Vepses, who formerly possessed a large territory and were a powerful people well into Slavic times. To the south and east of the Vepses lived the Merians, now linguistically extinct, who covered the territory between the Oka and the upper Volga. Farther south and east lived the now equally extinct Muroma, and then various tribes of Cheremisses, and finally the Mordvins. The connecting links between the Vepses and the Cheremisses have disappeared, and the groups that have survived have suffered great losses of territory.

The position of the Carelians in this picture is not quite clear; it is known, however, that they had settled the shores of the White Sea as early as 900 A.D., and were later largely dislodged by Russians. They are linguistically a branch of the Baltic Finns most closely related to the Esthonians, but it is not known whether they ever were actually in Esthonia, or if so, whether they moved northward across the Gulf of Finland with the Finns, or around its eastern end. In any case, the Carelians now living in

Ingria and the Volga country seem to represent a secondary infiltration from the present Carelia rather than an early survival.

Although the departure of the ancestors of the Baltic Finns from their Volga homelands took place so early that the movements of the central Asiatic nomads did not affect them directly, these incursions were responsible for other Finno-Ugrian migrations. In the first century A.D., the Huns entered the Volga country and remained along its lower and middle course until after having routed the Ostrogoths, when they went on to the present Hungary. In the fifth century, after their misadventure in France, the Huns returned to the Don Basin and joined their relatives the Bolgars, who had come from the region of the Ural and Kuban Rivers in southeastern Russia, and had settled between Finns and Ugrians on the lower Volga and Kama. There they founded a powerful empire, which was to last from the eighth to the fourteenth centuries. Some of these Bolgars migrated to the lower Danube country and defeated the southern Slavs, settling in what is now Bulgaria. These Bulgarians later lost their Uralic speech, and adopted a Slavic language.

The Bolgars of the Volga ruled or at least influenced a number of Finno-Ugrian peoples; the Mordvins, Cheremisses, Votiaks, Syryenians, and Magyars. The modern Chuvash of eastern Russia are the linguistic descendants of the Bolgars, but are thought to be largely Finnish in blood. It was at the time of the Bolgar empire or later that the Syryenians moved northward, as did the Votiaks, who remained somewhat nearer the center of dispersion. Only the Cheremisses and Mordvins still remain in the original Finno-Ugrian home territory.

Under Turkish leaders a large body of Ugri left this region and migrated to the southern steppes, whence in the ninth century they moved to Hungary, and mixed with the remnants of the Huns and Avars who dwelt there. These Ugri became the Magyars, the modern Hungarians, whose language is still basically Ugrian, modified by much Turkish influence.

The closest linguistic relatives of the Magyars are the Voguls and Ostiaks, members of primitive hunting and fishing tribes of the Obi country in Siberia. By the end of the first millennium A.D., they had moved to the northeastern section of European Russia, where they are said to have lived with the Samoyeds. The northward movement of Russian colonists forced them over into Siberia, and by 1364 they were already entirely located on the Asiatic side. Today they are still primitive hunters and fishermen, and shamanists in religion. It is believed, however, on philological grounds, as well as on historical, that before their migration northward and eastward they were farmers and herdsmen.

The Finno-Ugrians today include peoples in every stage of culture from hunting and fishing to that of modern civilized states. They are

held together by a bond of language and by a certain modicum of old cultural traits, particularly those concerned with music and poetry, with which high and low cultural levels fail to interfere. Although aggressively persistent on the peripheries of their radius of migration, they have become recessive in the center of it, where the great surges of invasion and of empire from central Asia, and the subsequent steady and irresistible expansion of the eastern Slavs, have reduced their cultural survivors to a minimum, while their physical survivors, since they form an important element in the composition of modern Russia, are much more numerous. In view of their history the Finno-Ugrians are a much more important factor in the building of eastern Europe than their present numbers would, on the surface, indicate.

(9) RACIAL CHARACTERS OF THE EASTERN FINNS

Before studying in detail the physical characters of the Finno-Ugrian-speaking peoples apart from the Baltic group and from the Hungarians, it will simplify matters considerably to state one fact which the existing anthropometric documents make evident: *these peoples are all very much alike.* The Mordvins, the Cheremisses, the Permians, the various Ingrian groups of the Leningrad region, and the Carelians as well, vary among themselves to only a very minor degree. In this respect they differ not only from the Baltic Finns and Magyars, but also to a lesser extent from the Ugrian-speaking peoples of Siberia. In order to define the basic racial type of the present-day central Finnic peoples, it will be easiest to describe that one group which has been subjected to the most thorough and most definitive modern racial study, the Carelians,[72] and afterwards to see how the description so obtained applies individually to the other Finnic peoples.

There are nearly half a million Carelians in Europe; approximately half of these live in eastern Finland, and the rest are divided between the Carelian Republic of the USSR, which is adjoining, and small ethnic islands in the upper Volga country.[73] Zolotarev's adult male sample includes 728 from the Carelian Republic, and 277 from the Volga country. In both divisions, what he considers dark hair is found among 9 per cent of the whole, and the same is true for dark eyes. The Volga group has 27 per cent of hair designated as quite blond, while the remaining majority falls into the light brown and brown category. The Carelians of the Republic have, in contrast, 40 per cent of the lightest class. The opposite disproportion is true of eye color; 42 per cent of the Volga Carelians are called light eyed and 49 per cent mixed; in the Republic the figures are 35 per cent and 55 per cent respectively. To begin with,

[72] Zolotarev, D. A., *Kareli*, SSSR.
[73] *Atlas of Finland*, 1925. Zolotarev, **TKIP**, 1928.

therefore, the Carelians are typically light or mixed in pigmentation, and fully or nearly as blond as most Scandinavians. There is little difference in degree of hair and eye pigment between these Finns and Iron Age Nordics. The Carelians are prevailingly ash-blond rather than golden, and only 4 men out of a thousand show any rufosity.

The mean stature of the total Carelian group is 165.7 cm., with the Volga males slightly taller than those farther north and west. This is a moderate or medium height, neither notably tall nor short; it is short by Nordic standards, and about average when compared with that of most Russians. The bodily proportions as indicated by Zolotarev's data as well as by those of other investigators do not show the lateral, heavily built type predicted by the study of Finnish influence in Scandinavia; on the contrary, the relative sitting height index of 53 is little higher than that expected among Nordics. The shoulder and hip diameters are similarly of an intermediate European form. The Carelians are not distinguished by any notable peculiarity in body build, and are more nearly slender than massive.

The head dimensions, while variable, are smaller than those we have found among Scandinavian peoples. The mean length for the total group is 187.8 mm., for the Volga sample 186.0 mm.; ten whole millimeters shorter, for example, than the Icelandic head length. At the same time the breadth, 152.1 mm. for the total group and only 151.7 mm. for the Volga Carelians, is less than that of many dolichocephalic Scandinavians. The cephalic index, which varies between the extremes of 69 and 90, has a mean of 81.1 for the total, 80.9 for the Republic sample, and 81.6 for the Volga group. The standard deviation of 3.3 index points for the total shows that the Carelians form a reasonably homogeneous group in this respect. The head form of these basic Finns is therefore sub-brachycephalic, or falls into an extremely high mesocephalic category. In size, as well as in proportions, the Carelian head stands close to the old Neolithic Danubian racial standard. The vault elevation of 127 mm. is high, but not extremely high; it is equal to that of Iron Age Nordics in Scandinavia, and comparable to that found on the skull among Danubians.

The forehead breadth of 105.8 mm. is again equal to that of Nordics, while the bizygomatic of 139.4 mm. is slightly wider; the total face height of 120.8 mm. is between short and medium. The facial index of 86.8 falls into a moderately broad-faced category. The nose is absolutely quite short (50.9 mm.) and of only moderate breadth (35.5 mm.). The resultant nasal index, 70.2 in the total group and 69.5 in the Volga sample, lies on the borderline between leptorrhiny and mesorrhiny. One of the most distinctive measurements in this Carelian group is the interorbital diameter, with a mean of 34.1 mm., which shows the expected wide-eyed Finnish form.

On the whole, the Carelian sample shows nothing in common metrically with the large-headed mesocephalic and brachycephalic populations of western Norway and Denmark; it may be compared, however, most profitably with the Iron Age Nordic type of eastern Scandinavia; in comparison with the latter, the Carelians are short in stature, short in absolute head length, short in face height and nose height, and slightly broad in face breadth. The metrical position of the Carelians among living European races is comparable to that of the Danubian type in the skeletal series. Both in pigmentation and in basic metrical character it shows a certain fundamental relationship to the Iron Age Nordic form.

The observations tabulated by Zolotarev confirm this general impression. The facial outline is called rectangular in 55 per cent of the series, and ovoid in 33 per cent; the nasal profile is straight in half the sample, concave in 40 per cent, and convex in the remaining tenth. The tip of the nose points upward twice as frequently as downward; the lateral profile of the forehead is as a rule steep; in only one out of ten instances are the two profile lines parallel, as in the characteristic Nordic form. Mongoloid features, including an internal eyefold and extreme malar projection, are not typical, but are more frequent in the series from the Carelian Republic than in that from the Volga country. Only six men out of 1008 have the true Mongolian eyefold and these are all in the Republic series.

From these observations as from the measurements, we derive a composite picture of a moderately variable racial type which is more blond than brunet, but prevailingly light mixed in pigment character; square or oval faced, with a straight to concave snub-tipped nose, a steep, often protruberant forehead, and only moderately projecting malars. A slight facial flatness gives a superficial mongoloid impression, but evolved mongoloid features are usually lacking. Throughout there is an incipient Nordic suggestion, and in roughly ten per cent of the whole, the Nordic head form and facial features, with a longer, elliptical face and parallel forehead and nasal profiles, appear. There is undoubtedly a submerged Nordic element here, as well as a lesser mongoloid one.

In view of the general position of the central Finnic type, as exemplified by these Carelians, it has seemed most in accordance with the facts to leave the designation *East Baltic* for the larger-bodied, larger-headed, and quite different population of the eastern Baltic states, whether Finnic or Baltic-speaking, and not to attach it to this clearly differentiated racial group which has its geographical center elsewhere. In view of the close similarity between this central Finnic type and the Danubian racial entity suggested by the early skeletal material, and in view of the fact that the earliest identifiable Finnic skeletal remains were mostly of this type,

it has seemed appropriate, as stated in the concluding section of Chapter VIII, to name this racial type *Neo-Danubian.*

In the early Finnish skeletal remains there was evidence of considerable admixture with wide-eyed, broad-faced, meso- and brachycephals from the northern forest, and to a lesser extent with what seemed to be Corded people or evolved Nordics; these same admixtures are equally apparent in the present amalgam, which however remains, for the most part, of the same basic racial type to which the earliest agriculturalists to enter central Europe overland from the east belonged. It is a mistake to associate the origins of the Finnic people and Finnic speech with a forest culture, on the basis of modern associations; the Finns were from the start agriculturalists, and have remained such when circumstances have permitted.

Let us now study the other Finnic groups inhabiting Russian territory. Data on the physical characters of Ingrians are extremely scarce; the Ijores,[74] with a mean of 165.6 cm., equal the Carelians in stature, while the two Leningrad tribes, the Evremeiset and Savakot,[75] are taller (167.1 cm.). The Ijores have a mean cephalic index of 82.6, the Vodes [76] of 83.2. Thus the deviation of the Ingrians, as shown by this evidence from the Carelian standard, is in the direction of brachycephaly. The Vepses, who live in a more northerly habitat, are close to the Carelian means in these two criteria, with 164.0 cm. for stature, and 81.9 for the cephalic index.[77] Observations on a small series of Vepses,[78] however, show a majority of brown hair shades, of gray eyes, of broad noses, and of oblique eyes, with a weak beard development in many cases, indicating a higher Mongoloid content in this group exposed to Lappish and Samoyed influences, than in most other Finnic samples.

Of the original Volga Finns, but two tribes, the Mordvins and the Cheremisses, retain their ethnic identities, while still living in the center of the original Finnish territory. The Mordvins are scattered in single villages and groups of villages throughout the middle Volga provinces; these settlements, although not continuous, contain collectively a large population, officially enumerated by Zolotarev at 1,167,537.[79] Some 35,000 more live apart from their own people in the Bashkir and Tatar republics, while over 50,000 more have been settled in Siberia and in the central Asiatic khanates. Since the Mordvins are excellent farmers and

[74] Zolotarev, D. A., **TKIP,** 1928, after Prelov, E. I., Alexandrova, A. I., and Ul', E. F.

[75] *Ibid.*

[76] Zolotarev, D. A., *Kareli,* SSSR, after Alexandrova.

[77] Zolotarev, D. A., *Kareli,* SSSR, after Rozov.

[78] Mainov, V. N., 1877, from a résumé in **AFA,** vol. 11, 1879, p. 329.

[79] Zolotarev, D. A., **TKIP,** #15, 1928.

hardy colonists, they were sent eastward in large numbers by the czars to settle newly opened agricultural lands.

The Cheremisses, who call themselves *Mari*, number about half a million, and live to the north of the Mordvins in the neighborhood of Kazan. Owing to its compactness, their territory has been given the status of an autonomous district. They are usually divided into two groups, the Forest Cheremisses and the Mountain Cheremisses; the former live in the lowlands on the western bank of the Volga, while the latter inhabit a more isolated territory to the east, where they preserve many pagan customs. Besides following the usual Finnish pursuits of farming and bee culture, the Cheremisses, like the Siberian Ugri, are also hunters and stream fishers.

The Mordvins and Cheremisses resemble each other closely in an anthropometric sense, and both in turn deviate but little from the standard established by our study of the Carelians.[80] The Mordvin stature mean is 166.4 cm., that of the Cheremisses 163.7 cm. In bodily proportions the Carelian similarity seems complete; in head dimensions the only difference is that the Mordvin vault (134 mm.) and that of the Cheremisses (130 mm.) may be slightly higher, although these differences may in part be due to technical factors. The faces of the Mordvins and Cheremisses are again slightly larger than those of the Carelians, with nasion-menton heights of 124 and 123 mm., and bizygomatic diameters of 141 and 140 mm. The Mordvin nasal index mean, 65.4, is leptorrhine, while that of the Cheremisses, 71.4, is mesorrhine.

In pigmentation and in soft part morphology, these Volga Finns resemble the Carelians less closely. Bunak, Sergeev, and Mainov find respectively 33 per cent, 52 per cent, and 60 per cent of light eyes among the Mordvins; while there is no specific information regarding the hair color of these people, Bunak's statement that 50 per cent of his series belongs to a brunet pigment type would indicate that brown was the commonest color. Among the Cheremisses, Sommier finds 28 per cent of light eyes as against 39 per cent of dark ones; 21 per cent of "light blond" hair, and 35 per cent which is dark brown and black. Thus the Cheremisses appear to be darker than their more southerly neighbors, and both darker than the Carelians. A special series of eastern or mountain Cheremisses, measured by Nikolsky, shows clear differences from the major

[80] The chief sources for Mordvins and Cheremisses are:
Bunak, V., **RAJ**, vol. 13, 1924, pp. 178–207.
Sergeev, V. I., **PCZA**, 1930, pp. 318–319.
Older works include:
Maliev, N., résumé in **AFA**, vol. 12, 1880, p. 392.
Nikolsky, B., résumé in **AFA**, vol. 26, 1899, pp. 187–190.
Sommier, S., **APA**, vol. 18, 1888, pp. 215–257.

group—with a mean stature of 167.4 cm., a cephalic index of 78.6, and 60 per cent of blue and gray eyes, and only 32 per cent of black and dark brown hair.

Observations of statistical value which describe these people are scarce. However, there seems to be a moderately high incidence of concavity of the nasal profile, 18 per cent among Mordvins and 39 per cent among Cheremisses; of a median eyefold, which is a sign, as a rule, of a low bony orbit—34 per cent among Mordvins and 46 per cent among Cheremisses; and 64 per cent of weak beard growth among Mordvins, and 77 per cent among Cheremisses. In general, the Cheremisses seem more mongoloid than the Mordvins, but on the other hand the isolated Forest Cheremisses preserve the least mongoloid type of all, and that closest to a Carelian and to a Nordic form. The implication is that while both Mordvins and Cheremisses preserve their original Finnic type with considerable fidelity, the infiltration of Mongol and Tatar peoples into their country since the time that the ancestors of the Carelians and other western tribes departed has had some recognizable effect upon them.

Parallel, in linguistic taxonomy, to the combined Baltic and Volga Finnic group is that of the Permians. These are divided into three living peoples, the Votiaks, Syryenians (or Zyrians), and Permiaks. All of these peoples live north of the Mordvins and Cheremisses, from whose general area they are said to have migrated. The most southerly are the Votiaks, who, numbering approximately half a million, live on the banks of the Kama River, a branch of the Volga, in the southeastern part of the former Viatka government. This region has been made into the Votiak Autonomous S. S. District by the Soviet authorities. Some 25,000 other Votiaks live in the Bashkir Republic, 20,000 in the Samarsk government, 1700 in Siberia, and others still in the Tatar Republic. In general, the modern destiny of the Votiaks has been to a certain extent associated with that of Turkish-speaking peoples. In their own language they call themselves *Udmurt*, and this language contains many loan words from Chuvash and Tatar speech. They have, however, failed to become Moslem; their religion, at the time of the Russian revolution, was officially Orthodox Christianity, which served as a cloak for the retention of much of the original Finnish heathendom.

Metrically the Votiaks resemble the Cheremisses very closely.[81] A cephalic index mean of 82 is slightly higher, and reflects a slightly smaller head length. The mean stature is 162 to 163 cm. The pigment characters

[81] Chief sources on the Votiaks are:
Chomiakov, M. N., **TKU**, vol. 43, #3, pp. 1–294. Résumé in **ZBFA**, vol. 17, 1912.
Maliev, N., **TKU**, vol. 4, #2, 1874, pp. 1–17. Résumé in **AFA**, vol. 9, 1876, p. 227.
Khonuakov, 1911, after Zolotarev, **TKIP**, 1928.
Teploukhov, S. A., after Zolotarev, **TKIP**, 1928.

of the iris are similar to those of the Mordvins and Cheremisses, since between 30 per cent and 35 per cent of eyes are called brown, and the rest divided between blue, gray, and mixed colors. In head hair color however, a difference may be seen, for Maliev's series shows that but 2 per cent are black, 32 per cent dark brown, 29 per cent brown, 15 per cent light brown, and 7 per cent flaxen. Of the rest, 11 per cent are listed as reddish-brown. Chomiakov confirms this high incidence of rufosity, with 6 per cent of red hair color. Among Maliev's subjects only 15 per cent had black or brown beards; of the others 47 per cent were listed as red. These Votiaks, then, are not as blond as the Carelians, but blondism is frequent and characteristic; rufosity, notably absent from both the Carelian group and from the Iron Age Nordic race, and not important among the two tribes of Volga Finns, becomes a major factor among Permians.

The Votiaks are usually deficient in body hair, and the beard is frequently sparse, although in individual cases very heavy beards and very abundant body hair are found. The Ainu-like pilosity of many Russian peasants is commoner among Slavs than among Finnic speakers, but is exceptional in both groups. Neither, by and large, are as hairy as most western European brachycephals. The hair form is predominantly straight, only exceptionally wavy or curly. Forty per cent of Votiaks are listed as long- or oval-faced; the remainder as round-, broad-, or flattish-faced. The nose is straight in 60 per cent of individuals, convex in but 12 per cent. Maliev states that 37 per cent are "solid" in bodily build, only 6 per cent linear or thin. All in all the Votiaks are typical Finns, slightly shorter and rounder headed than Carelians or Mordvins, oddly rufous, and not noticeably more mongoloid than their southerly neighbors.

North of the Votiaks live two allied tribes, the Syryenians and Permiaks, both of whom call themselves *Komi*. These two peoples are generally lumped into a single category, especially since they speak mutually intelligible languages and occupy contiguous territories. The Syryenians occupy the wide expanse stretching from 58° N. Latitude to the Arctic Ocean, and from the Ural Mountains on the east to the Pinega River, a tributary of the Dvina, on the west. There are also a few Syryenians who live on the Siberian side of the Urals. The chief town of the Syryenians is Ishma, on the Pechora River. The Permians live more on the eastern side of the upper Kama River. Population statistics regarding these peoples are very variable. Zolotarev gives 186,000 as the total for Syryenians living in Russia, and 9566 for Siberia. Jochelson estimates the Syryenians at 260,000, and the *Atlas of Finland* at 364,000. Zolotarev finds 130,000 Permiaks in the Komipermiaktsk and Berhuekamsk districts of Uralsk province.

Below 65° N. Latitude the Syryenians and Permiaks farm, and are noted

for their skill and perseverance in obtaining crops at such high latitudes. Beyond the line at which agriculture becomes impossible, the Syryenians breed reindeer and live a less settled existence. They are noted for their ability at trading and their general financial sharpness. In religion they are said to adhere strictly to Orthodox tenets and to have forsworn the pagan practices which linger on among the Votiaks.

In stature, in body build, and in head dimensions and proportions both the Permiaks and Syryenians seem to be identical with their relatives the Votiaks; [82] a difference between these peoples and the Volga Finns, however, may exist in nose form, for the nasal index mean of the Permiaks is 64.9,[82] of the Syryenians 65.7.[82] Only 11 per cent of Syryenians, and 14 per cent of Permiaks, are said to have dark eyes; thus these northern Permians are perhaps both lighter eyed and more leptorrhine than most of the Volga Finnic group. One sub-group of Syryenians, living in the Ust-Sylosk district, seems to have mixed with Samoyeds or other non-Finnic peoples, for the cephalic index is 83.3, as contrasted with the usual mean of 81 for other Syryenians, and the ratio of dark eyes is twice that for the others.

In hair color, for the Syryenians as a whole, we find at last a series of observations based on the Fischer chart, and taken on a series of 400 individuals.[83] The authors divide the scale into three categories; dark (Fischer #4–8), golden (#9–15), and ashen (#16–26). The percentages are 53.1 per cent, 9.6 per cent, and 37.4 per cent. It is to be noticed that no individuals were listed as black, or as red. A medium or dark brown is the most numerous shade, with ash-blond next commonest. One is led, in view of this, to suspect that the high degree of rufosity reported among Votiaks may be partly of technical origin.

Summarizing the data on these Permian speakers, we may state that they seem to resemble the Carelian norm more completely in head and face form, and in pigmentation, than do the Cheremisses or Mordvins. It seems likely that those Finns and Permians who dispersed from their homes during the early centuries of the present era in a northward as well as in a westward direction carried with them the older Finnish features, while those who remained in their Volga home were to a greater extent affected by Tatar and other influences. On the whole, however, the

[82] Sources on these peoples are:
Alexandrova, A., Nurk, L., and Ul', E., **PCZA,** 1930, pp. 287–288.
Ivanovsky, A. L., **AFA,** vol. 48, 1925, pp. 1–12.
Maliev, N., **TKU,** vol. 16, #4, 1887.
Nalimov (after Zolotarev, **TKIP,** 1928).
Sevastianov (after Zolotarev, **TKIP,** 1928).
Vishnevsky, B., *Anthropologicheskiĭa Dannitĭa o Naselenit Permskaga Uezda.*

[83] Alexandrova, Nurk, and Ul', *op. cit.*

generalization that the entire body of Finnic and Permian speakers, apart from the Baltic groups which remain to be studied, are closely unified in race has been shown to be accurate.

Before concluding this survey of eastern Finno-Ugrian peoples, one further group requires examination, that of the Ostiaks and Voguls, the Ob-Ugrians, the primitive hunters and fishers of western Siberia, who are the closest linguistic relatives of the Magyars. The Ostiaks have been reduced to less than 20,000 individuals, while the Voguls number between 5000 and 7000. Some of the Ostiaks have been thoroughly Russianized, while others have mixed with Samoyeds, and have taken over reindeer breeding. At the time of the Russian expansion eastward into Siberia, the Ostiaks were the first to feel the pressure, and hence the southern part of their territory was taken from them, and they were reduced to more primitive circumstances than before.

One must expect the modern Ostiaks and Voguls to show the effects of centuries of reduced conditions of living, and this is, indeed, manifested in their reduction in stature; various means place them at levels between 154 and 160 cm., but the largest series of both groups fall in the 158–159 cm. category. The bodily form of both is in most cases slight and lean.[84] Sommier, with a series of 106 male Ostiaks, finds 50 per cent to have brown eyes, and the rest mixed and light; the Voguls are apparently somewhat lighter eyed.[85] About 25 per cent of Ostiaks have light brown or blond hair, and the Voguls are again slightly fairer.[86] In both groups and in all series, black hair is very much in the minority. Ten per cent of it among Ostiaks may well indicate Samoyed admixture. On the whole, these Siberian forest Ugrians are the darkest of the Finno-Ugrian-speaking peoples, aside from the Lapps, whom we have already studied.

The head form of the two Siberian tribes is the same as that of the Volga Finns and Permians, the dimensions somewhat smaller. The faces seem to be shorter, and the noses are definitely mesorrhine. Photographic evidence makes it certain that both the Voguls and Ostiaks have absorbed a perceptible amount of mongoloid blood, which manifests itself especially in facial features. They are still, however, bas-

[84] Chief sources on Ostiaks and Voguls are:
Maliev, N. M., **RAJ**, vol. 5, 1901, pp. 73–81.
Rudenko, S. I., **BMSA**, vol. 6, ser. 5, 1914, pp. 123–143.
Sommier, S., **APA**, vol. 17, 1887, pp. 71–222.

[85] Rudenko finds 87 per cent of brown eyes among 53 Ostiaks, 76 per cent among 75 Voguls

[86] Rudenko, again, has 96 per cent brown hair for Ostiaks, 81 per cent for Voguls. I have taken Sommier's figures in preference to Rudenko's because Sommier's series are larger and his hair and eye color classifications more detailed, permitting judgment and recombination.

ically similar in most characters to their relatives on the other side of the Urals.[87]

(10) THE BALTIC FINNS: LIVS AND ESTHS

For the sake of continuity, let us return to the beginning of section eight, in which we expressed the intention of studying the racial composition of the Baltic Finns. We have seen, in the meanwhile, that the basic Finnic racial type, to which belong the Volga Finns and their relatives from Carelia to the Obi River, is a modern counterpart of the prehistoric Danubian race, with leanings in both a Nordic and a Ladogan direction. This type has been, therefore, named Neo-Danubian. It was this Neo-Danubian racial type that the ancestors of the Baltic Finns must have brought with them from the Volga country in their westward migrations during the centuries immediately preceding and after the time of Christ. The deviations of the modern Baltic Finns from this type will reflect the influence of the earlier inhabitants of the Baltic shorelands upon the invaders, and to a lesser extent, the influence of later peoples who have been amalgamated into the Finnic ethnic body.

The earliest Baltic lands occupied by the invaders were Esthonia and much of modern Latvia, including especially Kurland and Livonia. These countries had, however, supported a population of some density for centuries before the Finnish arrival. The old Kammkeramik people of the tardy northern Neolithic are represented by the skulls from Salis Roje; large crania of at least two varieties, an incipient mongoloid, and a wide-faced mesocephal of Palaeolithic appearance. Food-producing people of a later date, who settled in numbers along the southern shore of the Gulf of Finland, are represented by numerous skeletal remains, which show them to have been a composite population characterized by extremely tall stature, robust bones and large bodies, large heads, with dimensions suggesting a blend of Corded and Upper Palaeolithic elements, comparable to that in western Norway. The early inhabitants of Esthonia

[87] There has been much misunderstanding about the head form of the Voguls, who are usually called dolichocephalic in secondary works. This misunderstanding is principally due to a misprint in Maliev's article (Maliev, 1901) in which the Vogul head length mean is given as 183 mm., and the breadth 148 mm., while the cephalic index is printed as 77. Actually, $\frac{148 \times 100}{183} = 80.9$. Rudenko, in his series of 75 Voguls, gives a cephalic index mean of 78.3, with length and breadth means of 192.2 and 149.9 mm. This figure, however, cannot represent the Voguls as a whole, since 72 Vogul crania in the Anthropological Museum of Moscow University have a mean cranial index of 78.3, which would be two points higher on the living. In the same way early and unreliable samples of Syryenians yielded cephalic index means as high as 87, which were widely copied and which, in company with the false Vogul mean, did much to mask the essential unity of the Finno-Ugrians in head form.

were especially high headed, and long and broad faced. It is the combination of the Kammkeramik forest types with this extravagantly proportioned human form, and with the immigrant Finns from the Volga country, that has produced the modern Baltic Finnish racial entity.

The most southerly of the surviving Baltic Finns are the Livs, who inhabit twelve villages situated along a strip of coast which extends on either side of the promontory of Domesnes, at the southern entrance of the Gulf of Riga, in the province of Kurland, Latvia.[88] The Livs are the last of the Finns in what is now Latvia to retain their native speech, for on the eastern side of the Gulf of Riga, the Livonian language died out in 1862. In 1852 there were 2354 Livs; in 1881, 2374; by 1920, however, the number had been reduced to 831, and it is probable that the Livs are destined to lose their language as well as their ethnic identity.

In view of this impending absorption, it is fortunate that the Livs have been subjected to careful anthropometric study.[89] Two series of 100 adult males each, measured in 1878 and 1922, both yield a mean stature of 174 cm.; hence the Livs are very tall, and have derived none of their height through the modern increase mechanism which has elevated other peoples in northwestern Europe. They are large boned, long limbed, and at the same time heavy and powerfully built; their shoulders are broad, but their relative sitting height of 51.3 shows an excess of leg rather than body length. Their heads and faces are both large, comparable in size to those of western Norwegians. Length and breadth diameters of the head, with means of 193.3 mm. and 155.1 mm., produce a cephalic index with a mean of 80.2, which, although the range runs from 70 to 90, is not especially variable. It will be observed that the head form of the eastern Finns has been preserved, while the head size has been greatly increased.

In the facial dimensions, however, a menton-nasion height of 122.5 mm. equals that of Carelians and other Finns of smaller total size, while the bizygomatic mean, 145.8 mm., greatly exceeds the Finnish standard. The resultant facial index, 84.1, is therefore low, and the Livs are definitely euryprosopic. Other facial widths are also extremely great; the minimum frontal mean is 110 mm., that of the bigonial 113 mm. Hence a broad brow and an extremely broad jaw are essential Liv features, as is a wide distance between the eyes. Although no nasal measurements have been taken, observations show that the nasal profile is usually straight, with an upturned snub tip in many instances. The orbits are horizontal, the lips

[88] The villages are (in Livonian) Musta-Num, Waida, Kuolka, on the Gulf of Riga; and Sonag, Pitrog, Kuostrog, Irai, Sikrog, Ud Külla, Ira, Piza Külla, and Luks Külla on the Baltic. The Letts call them by somewhat different names.

[89] Vildes, J., **LUR**, vol. 11, 1924, pp. 93–181.
Waldhauer, F., *Zur Anthropologie der Liven.*

usually thin, the lines which stretch from the nose to the corners of the mouth strongly marked. The hair form, although straight in three-fourths of the sample, is not infrequently deeply waved or curly. Furthermore, the body hair and beard are characteristically heavy.

The head hair, most frequently ash-blond or light to medium brown, is shown by a correlation based on the Fischer chart to be lighter than that for the kingdom of Norway, which is, on the same basis, the lightest in Scandinavia.[90] At the same time the eyes are specifically gray [91] in 74 per cent of the group, while blue eyes are exceptional, and brown irises limited to 8 per cent of the whole.

The foregoing description of the Livs shows that their metrical resemblance to the mother-type of the Finns is not close, and that they must have derived much of their racial heritage from the earlier inhabitants of the eastern Baltic lowlands. At the same time they preserve, whether by convergence or by heredity, the head form of the eastern Finns, and some of the most characteristic Finnish facial features. Their chief difference from the Finnic prototype is an excess of body and head size, an excess of facial breadths, of blondism, and of hairiness. They represent an extreme form of what is designated in the present work as the east Baltic race, a racial entity in which the previously described Neo-Danubian race, whether acting through a Finnic or an Indo-European linguistic and cultural medium, is a contributing factor.

The Esthonians, who number over a million in their own country and some 150,000 in Russia, resemble the Livs in most respects.[92] Tall stature of 172 cm. or over is typical of the Esths who live on the island of Ösel and along the northern and western coast; inland, means of 170 cm. are usual, while in the southeastern parishes this is reduced to 168 cm. There is some evidence that the tall stature of the Esths is in part due to a modern increase, since in 1878 regional recruit means draughted into the Russian

[90] A comparison between Vildes's series of 100 adult male Livs with the younger Norwegian recruit total from Bryn and Schreiner, with a series of Finnish hair samples studied by the author, and with a Lettish series which will be studied later, follows. The grouping is that of Vildes.

Fischer Numbers	Designation (Vildes)	Livs (100)	Norway	Finns	Letts
16–22	Lt. blond	3	1.46%	2.23%	1.33%
12–15, 23–24	Blond	17	11.6	8.99	4.00
9–11, 25–26	"Brunet"	45	37.1	40.22	49.33
5–8	"Dk. brunet"	29	44.9	48.60	40.00
4, 27, 28	"Black"	4	3.7	——	4.00
1–3	Red	2	1.34	——	1.33

[91] Apparently pure gray, since Vildes places "gray with brown rim" and "gray with brown speckles" under separate categories. Waldhauer's earlier work agrees closely with that of Vildes in eye color designations and ratios.

[92] Grube, O., *Anthropologische Untersuchungen an Esten.*
Michelsson, G., **ZFMA,** vol. 27, 1928–30, pp. 439–463.

army varied from 166 to 169 cm. In bodily proportions the Esths are seen to be frequently heavily built, with long bodies and the extremely high relative span of 107 or 108. It was this excessive development of the arms and shoulders, along with a wide mandible, that the Norwegians found most characteristic of the Finns who had affected the population of their southeastern provinces.

In head size and head form the Esths resemble the Livs closely, but are slightly longer headed, with a national cephalic index mean of 79.3. At the same time their faces are somewhat longer (124.7), while the excessive jaw breadth remains the same. What difference there is between the Esths and the Livs anthropometrically points to a greater Nordic content for the former, which is not surprising, since there have been a considerable mixture between Esths and Swedes, and a considerable absorption, in Esthonia, of early North Germans. The pigment character of the Esths is prevailingly blond, comparable to that of both Livs and Swedes; 56 per cent of the hair is called "fair," 43 per cent brown, and less than one per cent each are red and black. The eyes are blue in 25 per cent of cases, and gray in 51 per cent, while the brown class is said to include 13 per cent of the whole.

Two series of crania about 300 years old, from Esthonia and Livonia, show that the modern head form of the Livs and Esths dates back at least to that time.[93] At the same time these skulls show that the immediate ancestors of these Baltic Finns were broad-faced, not infrequently wide-nosed, and often low-orbitted. They serve further to define the East Baltic racial type in this region.

Out in the Gulf of Riga, between the Liv villages and the larger island of Ösel, is a small island called Runö, inhabited by an old population of Swedish fishermen. These Swedes, the subject of a special investigation,[94] closely resemble the Livs in most respects. The stature and head dimensions are the same, and the faces are equally broad. Nasal dimensions of 56 mm. and 37 mm. yield a nasal index of 66, which is leptorrhine as a mean, but one-fourth of the group is mesorrhine. The hair and eye colors are predominantly blond, and as great a blondism is found here as among the Livs. Ash-blond hair is found in over 60 per cent of the group. This series is not, however, as homogeneous as that of the Livs, but shows two distinct modes in a number of characters; one represents a sub-group with a stature of 176 cm., a cephalic index of 78.5, a high vault, and a nasal index of 63, while the other sub-group is characterized by a stature of

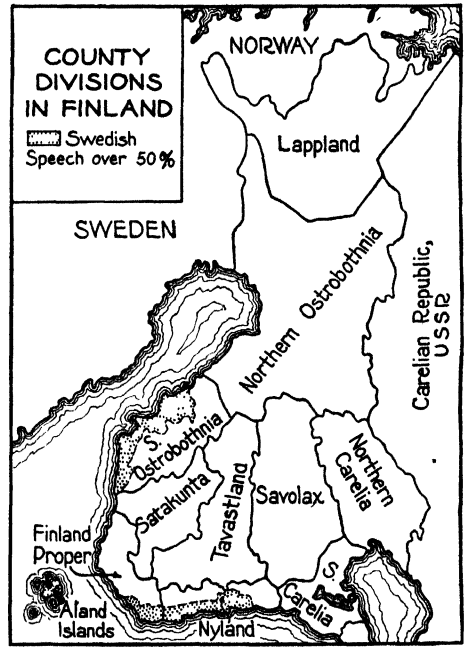
[93] Knorre, G. von, **ZFMA,** vol. 28, 1930, pp. 256–312.
Priman, J., **LUR,** vol. 12, 1925, pp. 429–480.
Virchow, R., **ZFE,** vol. 10, 1878, pp. 141–154.
Witt, H., *Die Schädelform der Esten.*

[94] Hildén, K., **Fennia,** vol. 47, #3, 1927.

169 cm., a cephalic index of 80.5, a lower vault, and a nasal index of 67. Both sub-groups are equally blond, and equally ashen in hair color. These sub-groups may represent in the first case a Nordic of strong Corded inspiration, in the second case a more typically Finnic element. This division serves to emphasize the fact that in the East Baltic countries as elsewhere the predominant type of the population is not stable, but individuals showing older combinations are common.

(11) THE BALTIC FINNS: FINLAND

As we have seen in our review of Finno-Ugrian tribal history, Finland itself was the last region to be invaded and fully colonized by Finns. At the same time it has always maintained close relationships with Sweden, before as well as after the Finnish migration from Esthonia. Skeletal remains from Ostrobothnia, dating from the Early Iron Age, resemble closely the Iron Age Nordic crania from Sweden,[95] while other skulls, from the thirteenth and fourteenth centuries onward, include a majority of brachycephalic examples, and thus witness the arrival of the Finns from their ancestral homelands in the Middle Volga country, whence they had been impelled by Slavic and Turko-Mongol pressure.



MAP 11

Modern Finland is divided into nine counties (landskap) which are based on old tribal affiliations, and also into administrative divisions (län) of more recent designation. The counties, in both Swedish and Finnish, bear the names of, and contain the proportions of Finnish and of Swedish speakers shown in the table on the following page.

[95] Retzius, G., *Finska Kranier.*
Westerlund, F. W., **Fennia,** vol. 18, #2, 1900, pp. 1–31, 90–96; vol. 32, #4, 1912, pp. 1–43.

English or Swedish	Finnish	Per Cent Swedes	Per Cent Finns
Åland Islands	Ahvenanmaa	99.12%	.88%
Finland Proper			
(Swedish communes)		87.6	12.4
(Finnish communes)	Länsisuomi	3.4	96.6
Satakunta	Satakunta	.9	99.1
Nyland			
(Swedish communes)		69.4	30.6
(Finnish communes)	Uusimaa	24.4	75.6
Tavastland	Häme	.9	99.1
Southern Ostrobothnia			
(Swedish communes)		95.0	5.0
(Finnish communes)	Etela Pohjanmaa	1.2	98.8
Savolax	Savo	.66	99.34
Carelia	Karjala	.70	99.30
Northern Ostrobothnia	Pohjois Pohjanmaa	.9	99.1

The Swedish population of Finland is almost exclusively confined to the Åland Islands, to Finland Proper, Nyland, and Southern Ostrobothnia, being concentrated in two non-contiguous coastal areas. The old Gothic settlement was largely located in Finland Proper and Satakunta, between the two Swedish areas of the present day.

These county divisions, which have their basis in tribal origins, are marked by dialectic differences. The Suomaläiset, or southwestern Finns, inhabit Finland Proper and Satakunta, and speak a dialect which, although closest to the Esthonian of any in Finland, has been influenced by the language of the Germanic people who preceded them and whom they absorbed. The Hämäläiset or Tavastians are said to represent, in least mixed form, the original Finnish invaders from Esthonia. The Savolaiset, or people of Savolax, are linguistically a mixture between Tavastians and Carelians; the latter are naturally identified with their tribal companions who live over the border in the Carelian S. S. Republic, and whom we have already studied. The Kainulaiset, or Kvaens, who live in northern Ostrobothnia and Finnish Lappland as well as in northern Norway and Sweden, although mixed to some extent with Lapps, are linguistically close to the Carelians. Historically, the Kvaens are, although partly of mixed Finnish origin, to be considered as an early, northern Carelian offshoot. The southern Ostrobothnians speak a dialect which is transitional between Tavastian and Kvaenish, the latter being their earlier speech.

These tribal differences are clearly reflected in stature; the Finns of Esthonian origin and those in districts where Gothic and Swedish blood has been absorbed, are tall, with local means as high as 172 cm., while in the Carelian and Kvaenish provinces the mean stature runs as low as

165 cm. There is no difference in this respect between the Swedish speakers and Finnish speakers in the southern and western counties.[96] The early recruit material enlisted between 1767 and 1906 shows the uniform stature mean of 169.6 cm., with less local variation than is found today, and no evidence of increase. The range of these early soldiers is from 137 cm. to 207 cm., and the latter figure reflects the fact that Finland has furnished some of the world's most famous cases of giantism. Like the Livs, the Finns have, apparently, always been tall, and have not been as much affected by the modern increase as have their neighbors across the Baltic. The bodily proportions of the Finns show no unusual features; a relative span of 104.5 [97] is higher than that of most Scandinavians, while a relative sitting height of 53 [98] is moderate.

The cephalic index means of the Finns vary from 79.3 in Finland proper, which is the same as that of the southern enclave of Swedish speakers, to 82.2 in Finnish Carelia, and 82.6 in northern Ostrobothnia. The distribution of this index takes the form of a gradual rise from the southwestern corner of Finland outward, to the east and north, until one reaches Carelian and Kvaenish country. These differences in the cephalic index are almost entirely differences in mean head length, ranging from 193.3 mm. in Finland Proper, to 188.1 mm. in Carelia and 187.6 mm. in northern Ostrobothnia. The breadth remains constant at a mean of 153 to 154 mm.[99] Thus the Carelians of Finland, and their northern relatives the Kvaens, preserve, to a large extent, the old Finnish head size and form, while the Finns Proper keep, in varying degree, the dimensions and proportions acquired by mixture with the descendants of earlier Baltic peoples, and with Goths and Swedes, both in Esthonia and in their new home. The Finnish head height mean, as determined by Luther, is 127 mm., which agrees both with the early Finnish condition and that to be expected from mixture with Scandinavians.

The faces of the Finns are large, with a constant bizygomatic diam-

[96] There is an abundance of data on Finnish stature, covering roughly 150,000 individuals, from 1768 A.D. to the present. Principal sources:

Hilden, K., **AFA,** vol. 47, 1923, pp. 36–40.

Kajava, Y., **AAnz,** vol. 2, 1925, pp. 228–253; **AASF,** ser. A, vol. 25, #5, 1925; **Fennia,** vol. 48 (*Atlas of Finland*), 1929, pp. 141–143.

Karvonen, J. J., **AASF,** ser. A, vol. 25, #6, 1926.

Nickul, K., **AASF,** ser. A, vol. 25, #4, 1925.

Westerlund, F. W., **Fennia,** vol. 18, #2, 1900, pp. 1–31, 90–96; vol. 32, #4, 1912, pp. 1–43.

Wilskman, I., *Tilastollisia tietoja Suomen kansan ruumülisestä kehityksestä,* III, *Miesten kasvutilastoa.*

[97] From unpublished material collected by Mr. Martin Luther for the Peabody Museum, and seriated by the author with the collector's permission.

[98] Westerlund, F. W., **Fennia,** 1912.

[99] Westerlund, F. W., **Fennia,** vol. 20, 1903, pp. 1–67. Also Luther's material.

eter[100] mean of 141 mm., whereas the menton-nasion heights vary provincially in harmony with the distribution of stature and of head length. The mean for the total is 126.5 mm., and the longest faces are found in southwestern Finland, while the shortest occur in the north.[101] The nasal index mean for Finland is 66, which is moderately leptorrhine and probably typical of the East Baltic group as a whole.[102] The bigonial diameter of the Finns is very broad,[103] quite equal to the standards of the Livs, and gives the Finnish face the square appearance for which it is noted.

The pigmentation of the Finns is as abundantly documented as are their stature and head form. Skin color, however, has been tabulated in only one study[104] of 154 males, of whom 121 were found to be "white," presumably in the extreme Scandinavian sense, while the others were listed as "yellowish" or "brunet." General observation of Finns, however, and descriptions by various authors, lead to the conclusion that the skin color of these people is as a rule unusually fair, but that in many cases it lacks surface vascularity.

If one may judge by a series of 176 hair samples from various parts of Finland,[105] then the Finns, like the Livs, are blonder than the Norwegian total, but less blond than Bryn's selected Eastern Valley farmers. The ash-blond series (Fischer #20–26) accounts for 36 per cent of the whole, while brown (Fischer #6–8) totals 47 per cent, and dark brown and black amount to less than 2 per cent. Reds are negligible, and black and really dark hair less frequent than in Scandinavia. Westerlund's recruit material[106] on a series of 6000 agrees with that of Luther, and yields less than one per cent of red. The Finns and Swedes of the western and southern provinces are almost identical in hair color proportions, although the Finns have a little more ash-blond, and the Swedes a little more brown. The distribution of hair color shows the greatest degree of blondism among the Finns living in Nyland, Finland Proper, and Satakunta—these have over 60 per cent of ash-blond and golden shades, more than the Swedish speakers; while in Carelia and the two Ostrobothnias the lesser blondism already determined for Carelians is found.

The eye color of the Finns is, as one would expect, prevailingly light,

[100] Kolmogorov, A. J., **AFA**, vol. 34, 1907, pp. 228–231. Also, Luther's data. Retzius, A., **CRCA**, 8me sess., Budapest, 1876, vol. 2, pp. 740–771.
[101] Luther. Retzius, whose means are 14 mm. lower, obviously located nasion too low.
[102] Westerlund, F. W., **Fennia**, 1912.
[103] Retzius, *op. cit.* Mean = 114 mm.
[104] Eliseev, A. V., résumé in **AFA**, vol. 26, 1900, pp. 803–807; from a Russian source.
[105] Collected by Luther, matched to the Fischer scale by the author.
[106] Westerlund, F. W., **Fennia**, vol. 21, 1904, pp. 1–58.

with blue commoner than gray. Westerlund finds but 7 per cent of brown eyes, and 15 per cent of mixed, while Luther's mixed group comprises 15 per cent. Since the eye color of the Finns and of the Swedes in the coastal regions is equally distributed, it is reasonable to suppose that Finland, in this respect, is about equal to Scandinavia. Blue eyes, with a regional maximum of 53 per cent, are commonest in southern Ostrobothnia; while gray eyes, attaining 37 per cent, are concentrated in Finland Proper. In four-fold correlation tables blue eyes go especially with brown, and gray eyes with ash-blond hair. The regional distribution of eye color, while following faithfully that of stature, head form, and hair color, is not as strongly marked as is the case with the metrical characters; the maximum of Westerlund's blue + gray classes combined is 83 per cent in Finland Proper, the minimum 71.8 per cent in northern Ostrobothnia; dark eyes vary only from 5.7 per cent to 9.1 per cent, in the same counties.

Morphological observations on modern Finns are rare. Those which are available indicate that the foreheads are usually high, broad, and only slightly sloping, and that, in general, the total facial profile resembles that of the eastern Finns rather than of Scandinavian Nordics. The nose is most often straight or slightly concave, and the nasion region smoothly curved over glabella, so that it is difficult to locate nasion. Browridges are usually only slightly developed. The nasal wings are usually of moderate spread, and as often flaring as compressed. Heavy mandibles, with powerful chins, are as typical of these as of other Finns. Within any random Finnish gathering, it is possible to pick out Nordic individuals of ordinary Iron Age type, as well as broad-faced, snub-nosed individuals who are exaggeratedly East Baltic. There is a considerable individual range, although the regional trends are well marked and constant.

On the whole the Finns are physically just what one would expect from their history; an amalgamation between an intrusive eastern Finnish population, Scandinavian Nordics, and earlier elements local to the eastern Baltic shores. The Finnish invaders seem, here as in Esthonia and among the Livs, to have preserved in many instances their characteristic cranial and facial morphology, while at the same time undergoing a great increase in size, and some increase in blondism, through the absorption of the other racial factors. The various component elements have not, in Finland, been completely absorbed and fused; correlations between stature, head form, face form, and pigmentation show that a tall, mesocephalic, brown-haired, and blue-eyed strain, which probably represents a Nordic element in a sense, but to a greater extent the old Corded race, may be contrasted with a shorter, rounder-headed type, with ash-blond hair and gray eyes, which is the original Finnic.

(12) THE BALTIC-SPEAKING PEOPLES

Our study of the northern racial zone of Europe has proceeded nearly to its conclusion; except for the northern Slavic regions there remain only the countries at the southeastern corner of the Baltic Sea, Latvia and Lithuania. These countries are occupied by the Letts and Lithuanians, the only surviving speakers of the Baltic branch of Indo-European languages. Baltic is a member of the Satem division, closest to Slavic, and is at the same time the most archaic surviving form of Indo-European speech. It was formerly once spoken by a number of other peoples, including the Prussians, who gave it up in favor of German at the time of the Teutonic Knights, and perhaps also the White Russians, who may have adopted Slavic.

Like the rest of the Indo-European-speaking world, the original Balts were presumably Nordics, representing a blend of some sort between Neolithic Danubians and Corded peoples; unlike the other Indo-European groups, however, they have left no sure skeletal remains from their early history with which we may check this assumption. Their original home is believed to have lain between the territories of Finns, Slavs, and early Germanic tribes; it probably lay north of the old Slavic territory in southwestern Russia, on the upper reaches of the Dnieper.[107]

It is not known when the ancestors of the Baltic peoples left this primeval home and moved northwestward to their present habitat, but the bulk of the migration probably did not antedate the beginning of the Iron Age. During the late Neolithic of the northern countries, the River Düna, which now bisects Latvia, formed the southern boundary of the Kammkeramik culture, with which the Salis Roje and Lake Ladoga cranial types are associated; south of this river, descendants of the Corded people were apparently in possession of the land until the arrival of Germans and of the Baltic ancestors.

The ancestors of the Letts were the first to move northward; they were not followed by the Lithuanians until the dawn of historic times, and history began in that region about 1200 A.D. About that time the top of the Kurland peninsula was occupied, more extensively than at present, by the Livs, who also held the coastal portion of Livonia, along the eastern shore of the Gulf of Riga. South of the Livs, in Kurland, were the Kurs themselves, a tribe of undetermined linguistic affiliation, but which, whatever its former idiom, was soon converted to Lettish speech. South of Riga lived the Baltic-speaking Zemgaļi tribesmen; east of them, along the Düna, were the Seļi; while the Letgaļi, or Letts Proper, occupied the whole eastern half of modern Latvia. In historic times, the last named

[107] Hesch, M., *Letten, Litauer, Weissrussen.*

moved westward and absorbed the remnants of the other tribes, giving their speech and nationality to the present Lettish people.

The Germans, from the beginning, have played an important part in the history of the Baltic states, both as immigrants and as purveyors of Christianity and of mediaeval European civilization. In 1201 A.D. the city of Riga was founded by Germans from Bremen and Hamburg, and this was the commencement of a long period of concentrated German influence which made itself felt racially as well as culturally. The central points of German culture in the Baltic lands were the cities of Riga, Dorpat, and Reval, which belonged to the Hanseatic league.

In the thirteenth century the German religious orders began their work of conversion and conquest in this neighborhood; first the Sword-brothers, and then the Teutonic Knights. The latter were especially concerned with battling the Lithuanians, who had, in the thirteenth century, forced themselves into the territory between outposts of the order in Livonia and Prussia. One of the results of the activities of the Teutonic Knights was the defeat of the Zemgaļi; these tribesmen left their homes in numbers and joined forces with the Lithuanians, while the Letts themselves moved westward to replace them.

Despite the activity of the orders, the Lithuanians became, during the thirteenth century, a very powerful people, and founded an empire which reached from the Baltic to the Black Sea, and which included much territory occupied by Russians. In 1401 a Lithuanian prince married the Polish crown princess, uniting these two kingdoms, who together warred effectively against the Teutonic orders. A century later the Russians invaded Livonia, with 90,000 Tatar and Russian troops, and from this time on the Lithuanian political power was weakened. The independence of the Baltic peoples was destroyed in 1561, when Esthonia went to Sweden, and Latvia and Lithuania were handed back and forth between Russia, Poland, and Sweden; at the time of the final partitionment of Poland they went to Russia. In the sixteenth century the reformation spread over Latvia and Esthonia, and as a result of this the Letts are now Protestants, while the Lithuanians, who were the last Balts to be converted to Christianity, and who fell under Polish influence, are Catholics.

The ethnic significance of the history of this region is that much German blood must have been assimilated as a result of the building of the German cities, especially in Livonia, and Swedish and Russian influence during the historical period must have had some effect as well. Seven per cent of the modern population of Latvia and Esthonia is still German, and the nobility is almost entirely German in origin.

Opportunities for the absorption of mongoloid blood came at several times, especially in 1410, when the Lithuanian prince Witold sought help

from the Tatar Khan Tochtamysch, and was given 40,000 men who subsequently settled on the banks of the Niemen River near Vilna. In 1432 more Tatar allies came from the Volga, and 3000 of them remained in the service of the great Lithuanian princes.

The great Russian census of 1887 found 6540 persons of admitted Tatar ancestry in Lithuania, Poland, Volhynia, and Podolia. Many more must have been absorbed, while others, soon after their arrival, may have wandered eastward to their former homes. At any rate, in studying the racial composition of the Baltic peoples, the Finnic tribes who have been absorbed by the Letts (and in particular the Livs), the Germans, and the Tatars must not be forgotten.

There is an abundance of adequate modern anthropometric data on the Letts,[108] which indicates, on the whole, that despite regional and individual variations this people may, as accurately as the Finnish speakers upon whose territory they border, be considered representatives of the East Baltic race. The mean stature of Latvian males is nearly 172 cm., as tall as modern Nordics; this stature reaches the height of 174.7 cm. in the district of Liepaja, in southwestern Kurland, along the Baltic shore. In general it decreases slightly from west to east, but never goes below 170 cm. in the country districts. The city population, which contains a large foreign element, especially German, is two centimeters shorter than that for the nation. Bodily proportions show the Letts to be long legged, wide shouldered, and long armed; a mean relative span of 107 places them in the same class with the Finnish peoples.

The cranial dimensions and proportions are nearly the same as those of the Baltic Finns; the mean head length of 190 mm. and breadth of 153 mm. yields a sub-brachycephalic cephalic index of 81, while the vault height is of normal East Baltic dimensions. A selected sample of supposedly pure Letts, from the district of Cesvaine in eastern Latvia, has the same head form as the others, but larger length and breadth dimensions (193 mm. by 157 mm.). Unlike the Finns, however, the Letts seem once to have been longer-headed; early skeletal material which may definitely be ascribed to their ancestors, and which dates from 800 to 1200 A.D., is dolichocephalic, with a mean cranial index of 74.1 for a series of eleven male crania,[109] and of 74.4 for the same, with twelve female skulls added. These skulls are of moderate vault height, quite short and moderately broad faced, with mesorrhine to chamaerrhine noses, and low orbits. On the

[108] Backman, G., **FUL**, N. F., vol. 29, 1923–24, pp. 99–126, 127–163; **LUR**, vol. 12, 1925, pp. 367–379.
Hesch, M., *Letten, Litauer, Weissrussen.*
Jerums, N., and Vitols, T. M., **LUR**, vol. 18, 1928, pp. 279–375.
Waeber, O., *Beiträge zur Anthropologie der Letten.*

[109] Knorre, G. von, **ZFMA**, vol. 28, 1930, pp. 256–312.

whole they represent a variety of Nordic in which a short-faced, low-orbitted element is especially prominent. The change in head form of the Letts,[110] less radical than that found in many parts of central and eastern Europe, may almost certainly be ascribed here to a general absorption of round-headed racial elements, of which several have been historically traced.

In facial dimensions, the living Letts are again East Baltic, with broad foreheads (110 mm.), moderately broad bizygomatic diameters (137–140 mm.), and broad jaws (ca. 110 mm.). The face heights, at the same time, are only moderately great (122 mm.), and the facial index is mesoprosopic. An upper facial index of 50 falls into the broad category, and emphasizes the depth of the Lettish mandible. The nose, moderately leptorrhine, with mean indices varying from 63 to 67, is similar in size and proportions to the Baltic Finnish standard. In a combined sample of Letts, Lithuanians, and White Russians, Hesch has shown that taller stature is associated with relatively long heads, narrow faces, and narrow noses, and vice versa. This evidence indicates that a Nordic or Corded element, or both, can probably still be isolated.

Pigmentation data on the Letts is abundant, and shows clearly that the Letts, as a group, are as blond as Swedes and Norwegians. The skin color, observed on the von Luschan chart, is uniformly fair, but rarely very vascular. The hair color is ash-blond in half the entire series, while the other half is more brown than golden blond. There seems to be very little black hair, and red totals less than one per cent. The distribution of hair color shows regional variations, of reversed concentric order, for the ash-blond hues are concentrated in the eastern half of the country, in the purest Lettish territory, while the western and coastal regions, occupied in earlier times by the Finnic tribes and by the enigmatic Kurs, is characterized by brown shades, especially on the golden side of the scale. The eye color of the Letts as a whole is predominantly light, with pure blues and grays totalling one-third, and predominantly light shades reaching between 57 per cent and 59 per cent; pure brown eyes are very rare, but dark-mixed eyes are not uncommon. On the whole, the hair color tends to be proportionately lighter than eye color.

The hair form of the Letts is straight in over 90 per cent of cases. Hair form was observed with hair color in the large recruit survey, and regional differences noted. Such differences, however, are slight when compared

[110] An inbred group of free farmers, holding special rights granted their ancestors in the thirteenth century and confirmed by Gustavus Adolphus, has been studied by Jerums and Priman. These people, who call themselves the "Kurish Kings," had been reduced, by 1925, to a total of 11 men and 12 women. They are very blond, and the men have a mean C. I. of 77.4, the women of 75.2. Backman believes that they represent the Lettish racial type of 700 years ago, preserved by inbreeding.

with those of hair color. The western regions, especially the country of the Livs and Kurs, have more straight hair than the east, but in no district does wavy hair attain more than 10 per cent. The Letts are surely straighter haired than are the peoples of Scandinavia, with the necessary exception of the Lapps.

The foreheads of the Letts slope very slightly or none at all in the vast majority of cases—retreating forehead profiles such as characterize the classical Nordic type are seldom encountered. The foreheads are in most cases likewise rather high and broad, and only moderately curved. The cranial vault is of a rounded form, and lacks the sharp transitions between the bones of the skull which have been seen in the Nordic. The occiput is in most instances well curved, and both flat and excessively protruberant forms are rare. The very few flatttened occiputs found by Hesch are attributed by him to a minority Armenoid element brought in by the Tatars, but it might equally well be ascribed to other sources.

The root of the nose is moderately high to quite high, and is of medium breadth. The bridge is of moderate breadth, and is usually straight in profile, although concave forms outnumber the convex. The tip of the nose is well rounded, and usually horizontal in inclination. Both elevated and depressed forms are infrequent. The wings are thin, highly placed, and of medium lateral extension, although compressed forms are quite frequent. The general impression of the nose is one of moderate height and breadth, and of medium, normally inclined tip and wings. It is not notable for its height or narrowness, and at the same time is only rarely broad or everted. It is a normal, intermediate European type of nose, not very different from the Nordic. The lips are medium to thin, and usually have little or no eversion, possibly because the bite is frequently edge-to-edge. The teeth are said to be remarkably large and of excellent quality, with a minimum of caries and malformations.

In the soft parts of the eye region, the upper eyefold hangs down to or over the outer corner of the eye, in a characteristic external fold, in the majority of fully adult instances. The opening of the eye slit is medium to wide, and usually straight of axis, although in one-third of instances an upward obliquity of the outer eye corners was observed. The malars are rather prominent among the Letts, although not as frequently as among most Finns. The lower angles of the jaw, too, are frequently salient, and the face, although oval or elliptical in over two-thirds of instances, is in other cases rectangular in form.

Body hair is absent in more than half of adult male Letts, and arm and leg hair quite scanty. The mustache is described as being sub-medium in thickness in over half of the cases, and the hair on the cheeks and chin is even less abundant. Although the head hair is usually straight, the mus-

tache and beard are characteristically wavy, the body hair wavier, and the pubic hair, as with practically all Europeans, curly.

Although Nordic types may frequently be picked out of the Lettish population, the general impression is that alongside the Nordic is found a much more numerous element, equally blond, which is essentially East Baltic, and which is much the same as that found among the Finnic-speaking peoples farther north. The one region of Latvia in which unusual or atypical racial conditions are found is the southwestern coastal section of Kurland, the home of the linguistically unidentified Kurs, who seem to have been especially characterized by extremely tall stature and brown hair. This racial element is probably that which entered into the composition of the Livs to differentiate them from other Finns; and its general description would suggest that here we are concerned with a maximum survival of the descendants of the Corded people who found in this northern retreat a relatively inviolable asylum.

Whereas the Letts have long been in close contact with Finnish peoples, and have absorbed whole Finnish tribes, the Lithuanians have been in contact rather with Slavic peoples, especially Poles and Russians. German influence has been important in each, while in Lithuania there is a not inconsiderable Jewish population. In Lithuania, however, we begin to arrive in that complex part of Europe in which a village of one ethnic and linguistic type is alternated with that of another; in which many kinds of people live side by side, but between whom wholesale mixture is infrequent. Among the Lithuanians themselves there are two linguistic divisions; the Jmouds or Samogitians, who number nearly half a million and live in the western part of the Kaunas district, near the East Prussian border, and the Lithuanians proper, who number more than three millions.

Except for Hesch's study of war prisoners, the anthropometric sources on the Lithuanians are old, and less complete than those on the Letts.[111] They show, however, that the Lithuanians averaged two centimeters less in stature than the Letts, both in the Russian census of 1874–83, and during the World War. If they have increased in pace with the Letts, their present stature mean should be 168 or 169 cm. If not, it should fall between 166 and 167 cm. Despite a shorter stature, the Lithuanians have

[111] Baronas, I. O., **RAJ,** vol. 3, 1902, pp. 63–87; **AFA,** vol. 30, 1904, pp. 220–222.
Brennsohn, I., *Zur Anthropologie der Litauer.*
Hesch, M., *Letten, Litauer, und Weissrussen.*
Jantschuk, N. A., **IILE,** vol. 12, #6, 1890, pp. 200–211. Résumés in **AFA,** vol. 26, 1900, pp. 839–840; **Anth,** vol. 3, 1892, pp. 475–476.
Olechnowicz, W., **ZWAK,** vol. 18, 1895, pp. 47–76.
Talko-Hryncewicz, J., **ZWAK,** vol. 17, 1894, pp. 51–172; **MAAE,** vol. 9, 1907, pp. 11–86; vol. 12, 1912, pp. 3–112.

slightly broader shoulders and hips than the Letts, and these differences are magnified in the indices of bodily proportions. The span is both absolutely and relatively shorter, with an index of 105.6. The trunk length of the Lithuanians is greater, and the lower arm segment shorter. Thus in body build the Lithuanians frequently approach a thick-set constitutional type, while the Letts are more characteristically linear.

In head and face measurements, the Lithuanians differ from the Letts only in sagittal and vertical dimensions; the Lithuanian head is shorter, with a mean length of 188 mm., while the cephalic index has a mean of over 82; the facial breadths are similar to those of the Letts, while both total and upper face heights are a millimeter less; both facial and upper facial indices show a greater tendency to euryprosopy. The nose, at the same time, is a little shorter; the interorbital diameter slightly wider. In the interorbital, Hesch finds modes in his total series at 31 mm. and 34 mm.; the former seems to be Nordic, the latter East Baltic or Neo-Danubian.

In pigmentation the Lithuanians are less frequently blond than the Letts. This is true in skin color as in hair and eye shades, for over 70 per cent of Lithuanians have skin darker than von Luschan #10, while only 46 per cent of Letts were listed in this category. Dark brown hair (Fischer #4–5) is found in 40 per cent of Hesch's Lithuanian series, as against 21 per cent for his Letts. Of the remaining shades, ash-blond is the most frequent, and the darkest grade of ash-blond (Fischer #26), is the most frequent of all single numbers. Larger series observed without scales agree essentially with Hesch's material, but give the Lithuanians about 7 per cent of black or nearly black hair. The vast majority of Lithuanians have mixed eyes; only 10 per cent have pure light irises (Martin #15–16), as compared to 25 per cent for Letts; at the same time pure brown eyes number but 3 per cent. On the whole, therefore, one cannot say of the Lithuanians, as of the Finns, Esths, Livs, and Letts, that they are as blond as Scandinavians, but they are still predominantly light. There are probably regional variations of which our present data give us little positive indication.

A comparative study of hereditary landed aristocrats and of small land owners [112] shows, however, that class differences in physical type must be even greater. The privileged class had, in 1912, a mean stature of 172.8 cm., the small land owners of 164.8 cm.; there was a slight difference in pigmentation, with the gentry running to brown hair and blue eyes, and their economic inferiors to lighter hair and mixed or brown eyes. The head size of the upper class was much larger, but the head form, face form and nose form were the same in each.

In hair form the Lithuanians, like the Letts, are almost all in the straight

[112] Talko-Hryncewicz, J., 1912.

category. Three per cent of Lithuanians have curly hair, as against 7 for the Jmouds, indicating that the farther east one goes, the straighter the hair becomes. Among Lithuanians proper and Jmouds, and among Letts as well, curly hair is almost always blond or light brown.

In observations of general head and forehead form the Lithuanians resemble the Letts, except that rounder heads with broader foreheads are more frequent. The nasal root is less frequently high, but little different in breadth; the bridge is somewhat broader, and runs to more convex and concave extremes in profile. The tip points upward in 35 per cent of cases, and is definitely snubbed in 22 per cent. In the high frequency of this broad, up-tilted form the Lithuanians exceed the Letts by two to one. On the whole the frequencies are greater at the extremes in the Lithuanian sample than in that of the Letts, and indicate a greater diversity of nose form.

The lips of the Lithuanians are somewhat thicker membranously, and more frequently everted than those of the Letts, although still they must be considered as medium. Great differences are found in the soft parts of the eye, for while an external fold occurs in 55 per cent of Letts, only 17 per cent of Lithuanians have it. Some degree of upward obliquity of the eye slit is found in 40 per cent of cases, slightly higher than with Letts. The chin form is usually rather wide and rounded. Although we have no comparative data on malars, the indication is that they are no less prominent, in any event, than those of the Letts. Although the Lithuanians are clearly less Nordic morphologically than are the Letts, they are at the same time less typically East Baltic in the Finnish sense in the total contour of the face, for more elliptical and fewer rectangular shapes are found among them.

The Lithuanians differ again from the Letts in having much less body hair, on chest and on arms and legs. Only 25 per cent have a medium mustache thickness, as judged by ordinary European standards, while the proportions on chin and cheek fall to 17 per cent and 10 per cent respectively. The unusual glabrousness of the Baltic-speaking peoples, as best exemplified by the Lithuanians, totally differentiates it from central European brachycephals of Alpine inspiration.

Talko-Hryncewicz, in his time one of the most assiduous students of race in eastern Europe, measured a series of so-called Lithuanian Tatars, the descendants of those Tatars who were brought into Lithuania for military purposes during the Middle Ages.[113] They differ physically from the Lithuanians in many respects, and thus show that their absorption has not yet been completed. In skin color more than one-fourth are brownish, and an equal number yellowish, while less than half may be classed as

[113] Talko-Hryncewicz, J., 1907.

light or white; less than 30 per cent are light or light brown haired, and over 70 per cent dark brown or black in hair color. In eye color almost half are classified as brown, and very few appear to be pure light. Although these Tatars are not purely brunet, they are much more brunet than the Lithuanians, and the light elements among them may not wholly be accounted for as the result of recent or local mixture.

In stature they are appreciably shorter than the Lithuanians, with a mean of 162.8 centimeters. Their head form, with a cephalic index of 81.9, is no different from that of the Lithuanians, although the absolute dimensions of the head, 183.6 and 151.4 millimeters, are smaller. Although the facial measurements are not comparable, the forehead is even broader than that of the Lithuanians, and the nose, while identical in breadth, is even shorter, with a nasal index of 69.4. As nearly as one may judge, these Tatars seem to have preserved in large measure the characters of their ancestors.

The deviation of the Lithuanians from their Lettish kinsmen cannot, however, be attributed in major degree to the absorption of Tatar blood. The Lithuanians are more southerly in habitat than the Letts, and are in contact with different neighbors; they form as a national group a branch of the greater East Baltic race, but a somewhat different variety from that of the other peoples living on the eastern side of the Baltic Sea. Their divergence in a racial sense points to the populations which we will study later in eastern Germany, Poland, and western Russia.

(13) CONCLUSIONS

The systematic study of the living peoples of the northern regions of Europe, by geographic, ethnic, and linguistic groups, has led to the following conclusions:

(1) This zone still shelters various groups of Upper Palaeolithic survivors. These include both reduced and unreduced varieties. The former includes the Lapps, whose home was formerly in the region of the Ural Mountains, and the Ladogan type of the eastern forest, which has blended with Danubian descendants to form a type known as Neo-Danubian. The latter includes full-sized descendants of the Brünn-type men of the Aurignacian, blended into the coastal population of Norway and into the Icelandic racial body; it also includes brachycephalic Borreby descendants in Norway, Denmark, and elsewhere.

(2) The eastern valley region of Norway, along with the Swedish plain, forms an area of maximum survival of the Iron Age Nordic race of central Europe.

(3) The East Baltic race in the strict sense is to be distinguished from the Neo-Danubian; it is concentrated in the eastern Baltic countries only

and consists of a blend of unreduced Upper Palaeolithic survivors with Corded people and with Neo-Danubians.

(4) Completely evolved mongoloids live on European soil, on the rim of the Arctic Ocean. These mongoloids are the Samoyeds, whose spread westward and northward from central Asia has been recent. Neither the Lapps nor the Ladogan derivatives are or ever have been fully mongoloid, but they have evolved a certain distance in a mongoloid direction. There is nothing specifically mongoloid about the Brünn or Borreby types, the unreduced Upper Palaeolithic survivors.

Except for the Lapps, none of the racial types mentioned is confined to regions studied in this chapter. We shall encounter all of the others elsewhere.

Chapter X

THE BRITISH ISLES

(1) RÉSUMÉ OF SKELETAL HISTORY

In the earlier historical chapters, various sections have been devoted to the racial history of Great Britain and Ireland. Before commencing the study of the living population of these islands, we shall bring this material together in a brief but continuous résumé, and dilate at greater length upon the skeletal remains which cover the period from the Middle Ages through the seventeenth century, to the threshold of modern times. Fortunately the documents concerning British racial history are abundant, and the picture which can be drawn is relatively clear.

Beginning with the Pleistocene, we recall that the earliest known *sapiens* men, Swanscombe and Galley Hill, were excavated from English soil, as was the still problematical Piltdown. During the last interglacial and the time of the final maximum ice, available portions of Great Britain were inhabited by men similar to the Upper Palaeolithic population in France, while in the post-glacial Mesolithic period, hunting and fishing peoples of central European origin invaded Scotland, and furnished to Ireland its earliest human inhabitants. This Mesolithic population is represented by the MacArthur's Cave skeleton, which resembles the Brünn-Předmost group of Late Pleistocene central Europe, and by others of doubtful age in both Scotland and Ireland, which belong essentially to the same racial type. These unreduced Upper Palaeolithic descendants who sought refuge in the British Isles after the glacial retreat clung on through a Late Mesolithic, and their descendants form, as we shall see presently, an element of some importance in the present racial composition of certain British regions.

The Neolithic economy was probably first brought to Britain by the bearers of the Windmill Hill culture from the Continent, and they in turn were members of the group which had invaded western Europe from North Africa by way of Gibraltar. The racial type to which these Windmill Hill people presumably belonged was a small Mediterranean, but there is little or no direct skeletal evidence from England to confirm this. By far the most important Neolithic movement into Great Britain, and into Ireland as well, came by sea from the eastern Mediterranean lands, using Spain as a halting point on the way. It was this invasion which passed up the Irish Channel to western and northern Scotland, and around to

Denmark and Sweden. The settlers who came by sea were the Megalithic people, and belonged to a clearly differentiated variety of tall, extremely long-headed Mediterranean, which was presumably for the most part brunet. This racial group furnished both Great Britain and Ireland, which consisted, before their arrival, of nearly empty land, with a numerous and civilized population which has left many descendants today.

With or shortly before the introduction of metal, the British Isles were invaded from both sides by fresh settlers. From the west came a triple combination of Borreby brachycephals, Corded people, and eastern Mediterranean Dinarics, under the hybrid auspices of the Zoned Beaker culture, which had grown into an important entity in southern and western Germany; these people entered England and Scotland, but not Ireland. From Spain or the southwestern French coast came the Food Vessel people, who represented the Dinaric element only, and who went first to Ireland and thence over into Scotland. Thus all parts of the British Isles, with the virtual exception of Wales, received an infusion of Dinaric blood, while the oversized Borreby and Corded elements also entered Great Britain, but avoided Ireland. These Bronze Age invaders pushed their Megalithic predecessors back into the hills and into economically undesirable country, whence many of their descendants later reëmerged. The Bronze Age lasted long in the British Isles, especially in Scotland, and the new Bronze Age racial amalgam attained a firm foothold, especially in eastern Scotland, in Yorkshire, and in such open country regions as Wiltshire, Gloucestershire, and Derbyshire. In the Late Bronze Age cremation, which had been an alternative funeral rite before, now became so fashionable that this period is a blank in our knowledge of British racial history. What few bones escaped complete destruction, however, suggest that with this new rite came an Alpine racial element from the Swiss highlands. This element could not, however, have been numerically very important.

Whoever the Bronze Age peoples were, and whatever languages they spoke, we know that the Iron Age invaders were uniformly Keltic; they came in various waves and at various times, through various ports of entry, but the cranial type of the invaders was inevitably the same. Both the Goidels of Ireland, and the Kymric A and B invaders of England, belonged to the Keltic Iron Age branch of the Nordic race; a type characterized by a medium-sized mesocephalic skull, with a low vault, a sloping forehead, a cylindrical lateral vault profile, a long, prominent nose, and a relatively small lower facial segment. Those who entered Ireland were tall; those who settled England and Wales were perhaps shorter. The Belgae, the last of the Iron Age Kelts or near-Kelts, despite their alleged Germanic mixture, cannot be shown to have differed from the others.

These Keltic invasions furnished Ireland with her upper class, but apparently not with the bulk of her population; in England regional Iron Age cemeteries disclose the survival of Bronze Age types, although the Keltic Iron Age people furnished a larger ultimate population element than any other contributing group which came before or after. These Kymric-speaking Iron Age people settled Britain as far north as the Clyde, but failed to penetrate the center and north of Scotland, where the Bronze Age people, who were apparently the Picts, continued undisturbed until after the time of Christ. The Cruithni, the Irish counterparts of the Picts, seem to have been absorbed by their neighbors earlier.

In Ireland the conquering Goidels were organized into clans, under the leadership of the high kings of Tara; other clans, formed of subservient people, and presumably of aborigines, were numerous, and gave the island its name. The mythical history of Ireland constantly refers to the arrival of immigrants, in different waves, from Spain. The Milesians, the actual Goidels, are said to have come directly from Spain, where they had sojourned for a short while, and before that from some distant homeland.[1] The crania from the Iron Age tombs are presumably those of Goidels, and not of the survivors of the previous inhabitants, some of whom, according to Irish legend, vanished underground, to haunt the megalithic monuments.

The Romans, in their conquest of Britain, probably introduced little of ultimate racial importance. The Roman officers themselves were almost exclusively of the standard Italic type, which differed little from that of the Kelts, except in stature; but they introduced to London and other towns urban populations from various parts of the empire in which the Alpine race seems to have been most noticeable.[2]

The inruption of the Angles, Saxons, and Jutes, which brought to England her present language and national identity, introduced into the eastern counties of both England and Scotland a numerous population of Iron Age Nordics fresh from Denmark and Germany. The Anglo-Saxons were tall, heavy-boned, long-faced mesocephals showing suggestions of the Tronder racial type which we have already studied in Norway.

At the same time that the Saxons were pressing the Picts on the eastern Scottish coasts, the Irish Goidels were invading Scotland from the east, and the two groups, the Germans and Kelts, squeezed the Picts between the two jaws of a pair of pincers. The Picts lost their language, whatever it may have been, and their ethnic identity, and at the same time Scotland assumed her traditional segregation into east and west, highlands and lowlands, Gaelic and Saxon speech.

[1] Hubert, H., *The Rise of the Celts*, pp. 192–197.
[2] Morant, G. M., and Hoadley, M. F., **Biometrika**, vol. 23, 1931, pp. 191–248.

The westward penetration of the Anglo-Saxons farther to the south isolated the shrinking area of Kymric speech into three disconnected centers; Strathclyde in the north, Wales in the middle, and Cornwall in the south. Of these three Strathclyde was the first to lose its Keltic speech, while that of Cornwall survived into the last century, and Welsh still remains. Soon after the Saxons had established themselves in England and Scotland, they were hampered by fresh invasions from Scandinavia, of Danes and Norwegians, who took over the most strongly Saxon sections of eastern England and Scotland. The Northmen sailed around the north of Scotland, settled the Orkneys, and also left colonies in the Hebrides and other western Scottish Isles, and in many parts of Ireland. Dublin itself and its neighborhood were long Danish territory. Along the western coast of Ireland, in many places where Gaelic speech has persisted longest, as on the Aran Isles, there may be seen a strong Scandinavian cast in the racial appearance of the population. The Norman invasions brought to the British Isles a further Scandinavian increment, somewhat mixed by its continental sojourn, and along with it adventurers from many parts of Europe. These Normans were not numerous enough, however, to affect any but the uppermost social levels of the nation.

The post-Norman racial history of England may be reconstructed to a certain extent by means of six large and abundantly documented series, three from the fourteenth and fifteenth centuries, and three from the seventeenth. The first three will be dealt with, not in chronological order because that is not precisely known, but rather in geographical sequence, from northeast to southeast to west.

In Rothwell, near Kettering in Northamptonshire, in the heart of the country most thickly settled by Saxons and later by Danes, a cryptful of skulls and other bones were discovered, about two hundred years ago, in an old church. Although the exact age and origin of these remains is not known, the most logical explanation is that they represent the local population of the fourteenth and fifteenth centuries.[3] The crypt contains between five and six thousand skulls, of which 100 male examples have been measured. Owing to the dampness of their resting place, the facial skeletons were mostly gone, and the few faces that had survived were not measured. The vaults fall quite close to the Keltic Iron Age type, although they are not identical with it, differing in possessing a greater flatness of the cranial base, and a slightly greater forehead breadth. They do not, however, resemble the skulls of Anglo-Saxons, and the significance of this series is that in the heart of Saxon country a population should have existed, as early or as late as the fourteenth century, which had almost entirely reverted to a pre-Saxon racial type. The male stature mean,

[3] Parsons, F. G., **JRAI**, vol. 40, 1910, pp. 483–504.

of 167 cm., is furthermore shorter than that of the Saxons and closer to what we assume to have been the Keltic Iron Age level.

In the vaulted ambulatory of St. Leonard's Church at Hythe, Kent, is another collection of skulls presumably from the fourteenth and fifteenth centuries, although they may range anywhere in date between 1100 and 1600 A.D.[4] These crania, of which 112 male specimens have been thoroughly studied, represent a fairly homogeneous brachycephalic group, of small to moderate head size, and of Alpine racial type. They can by no means be considered a Bronze Age survival, since they differ profoundly from any known Bronze Age form; they resemble, however, the Spitalsfields crania from Roman London, which represents a continental population, probably largely Italian, which had been transplanted to London by the Romans.

Stoessiger and Morant believe that by the time of this Kentish series, the Roman population of London, which must have survived the departure of the Roman authorities by several centuries, had been largely eliminated and replaced by new blood. In Kent, however, which was one of the most thoroughly Romanized parts of Britain,[5] they postulate a racial survival of the descendants of Roman-planted auxiliaries, marines, and tradesmen into the fourteenth and fifteenth centuries. Variations in the cranial index in different parts of the ambulatory suggest that the original heaping, being chronological, revealed a gradual change of type. In any case, the modern Kentish population is not of this Hythe type, which seems in the meanwhile to have disappeared by absorption.

A third but small collection of skulls of the same period comes from the mediaeval Carmelite Cemetery at Bristol.[6] It is estimated that during the fourteenth century 20 per cent of the inhabitants of Bristol were immigrants from southern France, but that in the following centuries this element, since it was not renewed, was absorbed into the general population. At the same time immigrants entered from Wales, Gloucestershire, and Somersetshire, in connection with the growing maritime importance of Bristol, and these latter replaced the French influence with a Kymric tinge.

In the early Bristol series, in which French blood was without doubt an important factor, mesocephaly is the rule, with a considerable range of head form. Both ordinary Keltic Iron Age type crania are found, and moderately large Alpine brachycephals with wide foreheads, which seem

[4] Stoessiger, B. N., and Morant, G. M., **Biometrika**, vol. 24, 1932, pp. 135–202.
Parsons, F. G., **JRAI**, vol. 38, 1908, pp. 419–450.

[5] West Hythe, Portus Limanus, was an important seaport in Roman times and later, but declined when the harbor silted up about 1600 A.D.

[6] Beddoe, J., **JRAI**, vol. 37, 1907, pp. 215–219.
See also Andree, R., *Globus*, vol. 27, 1900, p. 135.

to represent the French element. In our three series from the fourteenth and fifteenth centuries, then, we are struck by the tendency in England for local racial enclaves to persist and to be formed; the Rothwell series represents an Iron Age survival, that from Hythe a colonial carry-over from Roman times, and the Bristol collection a local Keltic and continental combination.

Let us turn to the seventeenth century, during which disasters of great magnitude took place in London, the chief of which was the great plague of 1666 A.D. Wholesale deaths which occurred during this century overcrowded the cemeteries, and resulted in the dumping of bodies into plague pits. Thus were formed the two large cranial series of Whitechapel [7] and Moorfields,[8] while a third, the Farringdon Street series,[9] was obtained by the disposal of a cemetery to obtain building space.

These three series are very similar to one another, although they are not identical; they, nevertheless, represent a single, clearly differentiated and reasonably homogeneous population. In all measurements, indices, and angles little difference can be found between the three hundred male crania of which these series are composed and the general series of Iron Age Keltic invaders of England. The resemblance is morphological as well as metrical; for the same low, cylindrical vaults, the same exaggeratedly sloping foreheads, and the same pinched faces and narrow noses, typify this city population of seventeenth century Londoners. The continental Roman townsman, as exemplified by the Spitalfields series, seems to have died out utterly in Defoe's London. There may, as Morant suggests, have been social selection at play in the formation of these series; the upper classes may have disposed of their dead elsewhere; still the seventeenth century London type must have been predominantly Iron Age Nordic of the Keltic variety, and this in turn must have been ancestral to the modern Cockney. The arrival in London and other English towns of several thousands of French Huguenots and of Dutchmen fleeing the cruelty of the Duke of Alva, took place for the most part too late in the seventeenth century for inclusion in the plague pits.

That the Keltic Iron Age cranial type, in mediaeval and modern times, is not confined to London, is made evident by a number of series from graveyards in other regions. A collection of 524 male skulls from a modern Glasgow cemetery, representing the western-central part of Scotland, shows the predominance of this racial type with considerable fidelity.[10] This series is drawn from the region in which the Scots of Deira settled

[7] MacDonnell, W. R., **Biometrika,** vol. 3, 1904, pp. 191–244.
[8] MacDonnell, W. R., **Biometrika,** vol. 5, 1906–07, pp. 88–104.
[9] Hooke, B. G. E., **Biometrika,** vol. 18, 1928, pp. 1–55.
[10] Young, M., **TRSE,** vol. 51, 1917, pp. 347–454; **Biometrika,** vol. 23, 1931, pp. 10–22.

when they moved across from Ireland and began their conquest and absorption of the Pictish kingdom. The inference is that the Goidelic invasion of western Scotland was an important mass movement of people.

Another series, including 54 male Lowland Scottish crania,[11] was drawn from the counties which include the former Kymric kingdom of Strathclyde, as well as part of Berenicia. In this series both Keltic Iron Age and Saxon type crania are represented, the former with the greater frequency. It is to be noted that the cranial type of the northern Kymri is not perceptibly different from that of the Irish-derived Gaels.

A third series, consisting of 22 modern male crania from the northeastern shires of Scotland, and mostly from Fifeshire, differs radically from the two described above.[12] Ten out of the twenty-two crania are brachycephalic, with the highest index 87, and the mean for the groups is 80.2. These skulls are large, with a mean cranial length of 185.4 mm.; they are both wide and long faced, with a bizygomatic mean of 135 mm., and a menton-nasion height of 123 mm.; they fall morphologically as well as metrically into a full-sized Bronze Age category, and represent the usual Bronze Age blend in which Borreby and Dinaric elements are most noticeable. The importance of this series is that in the part of Scotland which remained Pictish longest, an aggregation of crania from as late as the nineteenth century, selected at random, should show the survival of Bronze Age racial types in comparative purity.

(2) IRELAND

In the following study of the racial character of the living population of the British Isles, I shall reverse the usual order of "Great Britain and Ireland," and deal first with Eire. There are two excellent reasons for this decision; in the first place, Ireland, being the westernmost of the two islands, is the more marginal in an ethnological as well as geographical sense, it is the less varied, and has had the simpler racial history; in the second place, anthropometric data concerning the Irish are abundant, accurate, and detailed, while those which serve to describe the English, Welsh, and Scots are far less satisfactory.[13]

[11] Hooke, B. G. E., and Morant, G. M., **Biometrika**, vol. 18, 1926, pp. 99–104.
Turner, Sir W., **TRSE**, vol. 40, part iii, 1902–03, pp. 547–614; **JAPL**, vol. 37, 1903, pp. 392–408.

[12] Reworked from Turner, **TRSE**, vol. 51, 1917, pp. 171–253.

[13] This section is almost entirely based upon the as yet unpublished series of some 10,000 adult Irish males, drawn from all counties, all religious communities, and all social and occupational levels in both Eire and Northern Ireland. This huge and amply documented series was measured by Mr. C. Wesley Dupertuis under the auspices of the Division of Anthropology of Harvard University, and with the close coöperation of both governments in Ireland. The data have been tabulated and seriated in the Harvard Anthropometric Laboratory, under the direction of Professor Earnest A.

Historically, we have seen that Ireland was settled at successive periods by Palaeolithic survivors from northern Europe by way of Scotland, by Megalithic Atlanto-Mediterraneans, by Dinaric peoples from the eastern Mediterranean who came by way of Spain, by Keltic Iron Age Nordics, and by various groups of Scandinavians, of Normans, and of English. Of these various peoples the one which gave the island its language and the characteristic flavor of its historic culture was the Keltic. Christian Iron Age skeletal remains, from various parts of Ireland, belong predominantly to the Keltic Iron Age type, and are very similar to the skeletal series from sixteenth century London reviewed in the last section.[14]

The living Irish, who form the world's largest surviving bloc of Keltic people in the cultural sense, are also to a certain extent and in many instances representatives of this racial type; but this is not the chief one represented, and the individual Irish frequently recapitulate each of the different racial elements which have contributed to Irish ethnic history. By and large, geographical differences in Ireland are not great; it is possible to define a mean or total Irish type, and then to see how this may be broken up into local elements.

The composite Irishman, representing the mean of ten thousand of his countrymen, is 35 years old, 172 cm. tall, and weighs 157 pounds. He is well built, muscular, and large boned, with shoulders 39 cm. broad, and a trunk length which is 53.3 per cent of his total height. His arms are long, and his span is 105.3 per cent of his stature. So far, his bodily dimensions and proportions might be matched among western Norwegians, Icelanders, many Swedes, Livs, and Finns of Finland. His head is large, for Ireland has consistently the largest head size of any equal land area in Europe. The three principal vault dimensions of his head, 196 mm. by 154 mm. by 125 mm., give him the mesocephalic cephalic

Hooton. This material will be summarized in the following pages with the express permission of the appropriate authorities; its present use is intended in no way to anticipate the later publication of a detailed report by Professor Hooton and Mr. Dupertuis, which report will contain a careful racial analysis impossible here. Opinions expressed in these pages as to the racial significance of this material are my own, and do not necessarily anticipate the findings of the future authors of the detailed monograph.

Earlier works upon the physical anthropology of the living Irish, useful for comparative purposes and for detailed regional study, include:

Beddoe, J., **RBAA,** vol. 64, 1894, p. 775.

Browne, C. R., **PRIA,** ser. 3, vol. 3, 1893–96, pp. 317–370, 587–649; vol. 4, 1896–98, pp. 74–111; vol. 5, 1898–1900, pp. 223–268, 269–293; vol. 6, 1900–02, pp. 503–534.

Haddon, A. C., and Browne, C. R., *The Ethnography of the Aran Islands.*

Series of Irish measured in America are to be found in:

Gould, B. A., *Investigations in the Military and Anthropological Statistics of American Soldiers.*

Davenport, C. B., and Love, A. G., *Army Anthropometry.*

Hrdlička, A., *The Old Americans.*

[14] Howells, W. W., **AJPA,** vol. 23, 1937, pp. 19–29.

Martin, C. P., *Prehistoric Man in Ireland.*

index of nearly 79, and the moderately hypsicephalic length-height index of 64. His cranial vault, like his body, could again be matched among the larger-headed peoples of Scandinavia and the Baltic lands.

Both his forehead and his lower jaw are unusually broad, with minimum frontal and bigonial diameters of over 109 mm.; this great facial breadth is furthermore expressed by a bizygomatic diameter of 141 mm. The face is long as well as broad, with a menton-nasion height of 127 mm., and an upper face height of 73 mm. The facial index of over 90 is leptoprosopic, while the upper facial index of less than 52 is mesene. The nasal dimensions of 56 mm. and 36 mm. indicate a large nose, with an only moderately leptorrhine nasal index of between 64 and 65.

Without further details, it is possible to state what, in a general sense, the metrical dimensions and proportions summarized above must mean. In stature and in sagittal dimensions of the head and face, the composite Irishman might well be considered a Nordic in the Iron Age sense, of the Hallstatt variety as represented by living inhabitants of eastern Norway, or even of the Keltic Iron Age variety as represented by abundant skeletal series from England. But in total bulk and in lateral diameters, he exceeds any known Nordic form, and in fact cannot be considered an unmixed descendant of the greater Mediterranean family of races. He is comparable in these respects to the western Norwegians, to the Livs, and to some of the Finns. In order to explain his metrical character, it is necessary to invoke the mass absorption by either Megalithic Atlanto-Mediterraneans, or Iron Age Nordics, or both, of an earlier Upper Palaeolithic strain, which entered Ireland in a Mesolithic cultural condition. The living composite Irishman is not a pure Crô-Magnon or Brünn-Předmost man, but it would be no exaggeration to say that, from a metrical standpoint, at least half of his genetic ancestry is to be derived from such a source. Since the number of Mesolithic cultural survivors must have been quite small in proportion to that of the later invaders of Ireland, we are faced with a not uncommon situation, in which an older racial element has, by differential breeding rates, reëmerged.

Having established our composite Irishman, let us see what the differences are from this standard in reference to religious groups and to regions. The Catholics, who form the great majority of the population, fall close to the means reviewed above. The Presbyterians, who are concentrated in the North and who are in part the descendants of immigrants from Scotland, are a centimeter taller and three pounds heavier than the Catholics; their heads are a millimeter longer, a millimeter narrower, and a millimeter higher; their foreheads are a little narrower, their upper face heights longer, while other dimensions remain practically the same. The members of the Anglican Church of Ireland, on the other hand, are

virtually the same as the Catholics in height and weight, and in head length and head height, but are smaller in head breadth, the three breadths of the face, and in nose size. While the Orangemen slightly exceed the Catholics in some of the features which make the Irish type distinctive, the Church of Ireland Protestants tend rather toward a more usual Nordic metrical norm.

The regional differences are not great, with a single exception, that of the Aran Isles. The hypermarginal, culturally conservative Gaelic speakers of these islands seem to have formed, in isolation and by inbreeding, a distinct local racial entity. They are the tallest Irish group, with a mean stature of 174.5 cm.; they are longer legged, leaner, and lighter in weight than most of the others; their head length mean reaches the excessive dimension of 198.3 mm., while their head height, 120.3 mm., is extremely low. Thus they have the relatively low cephalic index of 77.8, and the orthocephalic length-height index of 60.7. Their total face height reaches the extreme mean of 130 mm., their nose height of 57 mm. It is impossible, at present at least, to discover a continental prototype for the Aran Island racial dimensions. For the moment we must consider it a local development of race-forming proportions.

Aside from the Aran Islands, we find that the tallest population lives along the western coast, from Galway to Kerry; the shortest in the east, in the counties of Wicklow, Carlow, and Dublin. The heaviest men live in the western counties, with one center in Mayo, Galway, and Roscommon, another in Kerry. In these counties the means attain 160–161 pounds; in the east, from Louth to Carlow, they fall to 153–154 pounds. There is very little regional variation in head length, but the breadth varies from means of over 155 mm. in Cork, Kerry, Limerick, Clare, and Mayo, to those between 152 and 153 mm. in all of southeastern and eastern counties included within a line drawn from Armagh to Longford, and south to Waterford. Head height varies little, and the same is true of the sagittal dimensions of the face. The same regional divisions which are seen in head breadth are maintained in the three breadths of the face; minimum frontals and bigonials of 110 and 111 mm. typify the western counties, of 107 and 108 mm. the eastern; western bizygomatic means run to 141 and 142 mm., those in the east to 139 mm. On the whole, greater size and greater laterality are concentrated in the western counties from Mayo and Galway to Cork, with Kerry as the greatest center; in Kerry the cephalic index rises to 80; in the eastern counties it falls to 78. The inference is that the maximum survival of the Mesolithic food-gathering population is to be found in the west and southwest of Ireland, in the more mountainous, more rugged part of the country, and in the very section which is poor in archaeological remains; on the other hand

the descendants of the later invaders, from Neolithic through Iron Age times, are most concentrated on the more fertile land along the Irish Sea, and on the Great Plain.

Let us now examine the pigment characters and morphological traits of the Irish, both as a total group and regionally. In the first place, the Irish are almost uniquely pale skinned when unexposed, untanned parts of the body, are observed. Out of 10,000 men, over 90 per cent had skins of the pale pink shade represented by von Luschan #3, while not a single individual was darker than von Luschan #11. Although regional differences are not great, they are suggestive. In the southwestern coastal regions which we have designated as a metrical unit, the darker shades run from 4 per cent to 7 per cent; in the east, in the central plain and the counties near and south of Dublin, they run from 10 per cent to 18 per cent.

The pale Irish skin, where exposed to the sun, shows a marked inclination to freckling. Forty per cent of the entire group are freckled to some extent; in Kerry the ratio rises as high as 60 per cent, in Waterford and Wexford, Carlow and Wicklow—the southeastern counties—it falls to 30 per cent. Thus a difference of two to one in this character serves to differentiate the southwest from the southeast even more clearly than do metrical criteria.

The hair form shows a difference between Protestants and Catholics; 44 per cent of Protestants have straight hair, and only 28 per cent of Catholics; the most numerous category in both groups, however, is low waves. The hair is almost uniformly medium in texture; coarse and fine alike are rare. The beard is moderately developed in the general European sense, extremely heavy and sparse beards are alike rare. At the same time the body hair, which is almost always present, is of a moderate development, and few very hairy men are found. The Aran Islanders are much less hairy, much thinner bearded, and on the whole straighter haired, than the other Irish. Elsewhere the waviest hair, along with a minimum of pilous development, is found in the Great Plain.

The hair color of the Irish is predominantly brown; black hair accounts for less than 3 per cent of the total, while the ashen series (Fischer #20–26) amounts to but one-half of one per cent. Forty per cent have dark brown hair (Fischer #4–5); 35 per cent have medium brown (Fischer #7–9); reddish brown hues total over 5 per cent (closest to Fischer #6, #10), while clear reds (Fischer #1–3) run higher than 4 per cent. The rest, some 15 per cent, fall into a light brown to golden blond category (Fischer #11–19). Thus the hair color of the Irish is darker than that of most regions of Scandinavia, but not much darker than Iceland; it is notably different from Nordic hair, as exemplified by eastern Norwegians and Swedes,

in its almost total lack of ash-blondism. The rufous hair color pigment reaches a world maximum here; not so much in reds as in the prevalence of golden hues in blond and brown shades. The lightest hair is found in the Aran Islands, where the commonest shade is, nevertheless, medium brown; in the southwestern counties there are more goldens and at the same time more dark-browns than in Ireland as a whole, while the Great Plain runs fairest of all. Red hair, with a regional maximum of 8 per cent, is commonest in Ulster, rarest in Waterford and Wexford.

In the proportion of pure light eyes, Ireland competes successfully with the blondest regions of Scandinavia. Over 46 per cent of the total group has pure light eyes, and of these all but 4 per cent are blue. Very light-mixed eyes (equivalent to Martin #13–14) account for another 30 per cent, while less than one-half of one per cent have pure brown. There is probably no population of equal size in the world which is lighter eyed, and bluer eyed, than the Irish. The almost total absence of gray eyes corresponds to the equal paucity of ash-blond hair. Compared to eastern Norway, Sweden, and Finnic and Baltic groups, the eye color is disproportionately light in comparison to hair color. Regional differences, while not great, are of some importance. The ratio of pure blue eyes falls to 33 per cent in Kerry and Clare, and rises to 50 per cent in other regions—Carlow and Wicklow in the southeast, and Armagh, Monaghan, and eastern Cavan in the North. On the whole, the east is lighter eyed than the west, as it is lighter haired. At the same time the Presbyterians are blonder than the Catholics, who are in turn fairer than the members of the Church of Ireland.

External eyefolds occur in 13 per cent of the total; median and internal eyefolds are apparently rare or lacking; eyebrows show some degree of concurrency in all but 2 per cent of the group, and the greatest concurrency is found in the north and east, the least in the south and west; regional differences are consistent but small. Since concurrent eyebrows are not a Nordic trait, and there cannot be enough Bronze Age Dinaric blood in Ireland to have spread this feature to the entire population, one assumes that it goes with the older Mesolithic strain. Bushy eyebrows, not included in this survey, are known by common observation to be prevalent among the Irish, especially in advanced age.

Moderately developed browridges are observed in over half the Irish group; pronounced ones in 20 per cent. A Mediterranean smoothness of the supraorbital region is rare. The strongest browridges are found in the Aran Islands and in the southwestern counties, especially in Kerry, Cork, Kilkenny, and Tipperary. Another center is found in Ulster, and on the whole the Protestants have heavier browridges than the Catholics.

In the profile of the nose, convex forms total 45 per cent, straight 48

per cent; while the rest are mostly concave. There is a special center of nasal convexity in the northwest, especially in Donegal, Mayo, and Galway. Concave profiles, on the other hand, are commonest in the southwest, and reach the ratio of 10 per cent in Kerry. Protestants are much more frequently convex in nasal profile than Catholics, and concavity is at a minimum among them.

The tip of the nose is of moderate thickness in three-fourths of the Irish, thick in almost all the rest; few have really thin tips. Such regional variation as there is shows that the fewest thick tips occur in the Aran Isles and in northwestern Ireland; the greatest number of them in the east, and on the Great Plain. The nasal tip of the Irish is, on the whole, too thick for a strictly Nordic classification. At the same time less than 2 per cent of these nasal tips point downward, and almost all the rest are inclined upward; pronouncedly upturned noses occur as frequently as in 20 per cent of cases in some counties. Aside from East Baltic and eastern Slavic countries, it is unlikely that any region in Europe possesses so high a ratio of elevated nasal tips, which, in the complex of races which have entered into the Irish people, can only be associated with the Palaeolithic element. The Alpines, Lapps, the East Baltics, and the central Asiatic mongoloids, all being to some extent Palaeolithic survivors, are all characteristically snub-nosed.

The nasal wings are almost uniformly medium in lateral extension; compressed and flaring forms are about equal in number and together form but 10 per cent of the whole. The distribution of these is of no importance, except that the most compressed are found in the Aran Isles. The lips are as a rule of moderate thickness and eversion; very thin, straight or convex lips are not uncommon, particularly in the south; while very thick or very everted lips are not found anywhere. The lips and the whole mouth region are sometimes, however, thrown into prominence by the presence of facial prognathism; this occurs in 8 per cent of the whole, while purely alveolar prognathism is found in but 2 per cent. There is a strong regional differentiation in both kinds of prognathism, however; the center of concentration is in the eastern counties, from Armagh to Waterford; facial prognathism reaches its maximum of 24 per cent in Wicklow and Carlow. It is interesting to note that the counties which show the maximum of Upper Palaeolithic features are the least prognathous of all, and that the Protestants show it more frequently, to a slight degree, than do the Catholics.

One feature for which the Irish face is famous in caricature, along with the freckles, the great malar breadth, the upturned nose, and the long, convex upper lip, is the great prominence of the chin. Sub-medium chin development, characteristic of many European racial groups, is found in

but 10 per cent of the whole in Ireland, but rises to 15 per cent and 17 per cent in the counties of Ulster, where it is commonest; the extremely projecting, square chin, often cleft, also attains nearly 10 per cent of the whole, and is concentrated in the southwestern counties of Cork, Kerry, Limerick, Kilkenny, and Tipperary, reaching a maximum of 15 per cent in Cork. One more feature, less noticeable on the living but even more important as a diagnostic of the Upper Palaeolithic survivors, is lambdoidal flattening. Among Irish Catholics this is found in 81 per cent of the whole, while among Presbyterian Protestants, only 27 per cent, and among Church of Ireland members, 40 per cent possess it. Its regional variability is greater than that of any other character studied; it ranges from over 90 per cent in all the western counties to but 54 per cent in Waterford and Wexford. On the other hand some degree of occipital flattening, which is associated with the Bronze Age Dinaric element in the Irish population, is perceptible in 18 per cent of the population, and is especially concentrated in Ulster and to a lesser extent in the east. It is especially prevalent among Protestants, particularly Presbyterians.

We have now reviewed in some detail the racial characters of the living Irish, and are prepared to make some tentative conclusions. These are: the Irish people represent a blend between two principal racial groups, (a) the survivors of the unreduced Upper Palaeolithic people of northwestern Europe, in a mesocephalic or sub-brachycephalic form, and (b) a Keltic Iron Age Nordic. The other two factors, (c) the tall, long-headed Mediterranean form brought by the Megalithic invaders, and (d) the Dinaric introduced during the Bronze Age, have both been submerged by the earliest and latest population waves.

The Upper Palaeolithic people are concentrated in southwestern Ireland, especially in Kerry and Cork; just in the part of Ireland from which the Irish in America are mostly derived. The Iron Age Nordic element is concentrated in the eastern counties and in the fertile Great Plain region of central Ireland; what other Nordic elements brought by Danes and English are also centered here. The Megalithic and Bronze Age minority elements are found also in the east, and the latter is particularly common among members of the Protestant landlord class.

By means of this study it is possible to reconstruct with some probability the living appearance of the Upper Palaeolithic men. They were typically tall, broad-shouldered, large-chested; their heads were large, their browridges heavy to medium; their foreheads broad and high; their faces were broad and slightly flattish, the mouth large, with lips of moderate thickness and little eversion, the lines around the mouth deeply drawn, the whole lower jaw wide and deep, with a prominent chin. The nose was of moderate to large size, straight to concave-profiled, with a

moderately thick, upturned tip. The hair was brown and wavy, frequently rufous, of medium abundance on beard and body; the eyes light-mixed blue. The skin was typically inclined to freckling, and very fair.

In contrast to this type, the Iron Age Keltic people were slightly shorter, and usually slender in bodily build, with finer bones; they were narrower in head and face diameters, with a more retreating forehead, a higher-bridged, more convex-profiled nose with a thin, less frequently everted tip; the mouth was smaller, and the mandible much shallower and narrower, the chin of more moderate dimensions. The hair was straight or wavy, brown or light brown in color, and the eyes typically blue.

It is impossible at present to define with equal clarity the two minor types; the Atlanto-Mediterranean element, if it were brown eyed and black haired, has completely lost its original pigment qualities through mixture. Yet "Mediterranean" types can be isolated in Ireland, and one may perhaps ascribe to them the occurrence of prognathism and some of the curly hair. If we grant that the eye color of the Megalithic people may have borne the germ of blondism, and may have changed, through mixture and other causes, to mixed and blue, then there are Megalithic descendants in Ireland who can easily be recognized. The planoccipital, brachycephalic, aquiline-nosed Dinaric element, if it were ever brunet, must also have lost its original pigment association; today it is frequently red haired.

(3) GREAT BRITAIN, GENERAL SURVEY

In comparison with Ireland, the larger and more populous island of Great Britain is more varied in topography and climate, and possesses a much greater regional variability in population. The materials which serve to describe the living British, while only partly adequate, nevertheless suffice to show that there are several important racial differences between them and the Irish. In the first place, none of the regionally differentiated British groups shows as great a reëmergence of the northern Brünn race as that in Ireland. In the second, brunet Mediterraneans, difficult to isolate in Ireland, have survived or reëmerged in large numbers in Wales and in the manufacturing districts of the Midlands and of Scotland. In the third place, the numerically predominant racial element in the British population is Nordic, with the Keltic Iron Age variety more important than the Anglo-Saxon or Germanic form. Brachycephals of Bronze Age inspiration are not uncommon as individuals, but have no large modern area of concentration.

In studying the modern British, let us first run over the whole island in a general way in a few characters, and then concentrate upon some

of the more distinctive local groups which seem to possess racial individualities of their own.

The pigmentation of the British has, in no large or significant series, been studied by means of standard charts. In regard to skin color, little is known from the statistical standpoint, except that it is characteristically fair,[15] and apparently as light as that of the Irish in most cases,[16] although in certain relatively brunet regions, such as Devonshire, Cornwall, Wales, and parts of western Scotland, there are without doubt darker-skinned minorities. The Irish tendency to freckling is also common in Great Britain, especially among the Scotch, who without doubt equal the Irish in this respect.[17] More characteristic of British skin than freckling, even, is its tendency to become red when constantly exposed to the air. This extreme vascularity, although without doubt partly climatic, must be racial to a certain extent, since it is accompanied by a physiological inability to tan.

Taking Great Britain as a whole, the hair color of its inhabitants is very similar to that of the Irish, except that the British have more light brown, and the Irish more dark brown, shades. In this comparison, England, including Wales, is nearly identical with Scotland. Both the English and the Scotch have as much red hair as the Irish, while the Welsh have more; both the Scotch and the Irish have somewhat higher increments of black hair than England with Wales; and if Wales is studied separately, England emerges as the lightest haired of the four major divisions of the British Isles, and Wales as the darkest.[18]

The regional distribution of hair color in Great Britain [19] closely follows

[15] Luschan, F. von, and Emma von, **ZFE**, vol. 46, 1914, pp. 58–80. This study contains observations on 84 British scientists, taken with the von Luschan table.

[16] Hooton, E. A., in data on many thousands of American prison inmates, finds prisoners of British birth to be as fair skinned as Irish and Scandinavian prisoners. Hooton, E. A., *The American Criminal.*

[17] From Hooton's criminal material.

[18] This comparison is based largely upon the study of 30,000 soldiers born in the British Isles, who served in the Union Army during the American Civil War, and upon a further study of 12,000 who served in the American Expeditionary Forces during the World War.

Gould, B. A., *Investigations in the Military and Anthropological Statistics of American Soldiers.*

Davenport, C. B., and Love, A. G., *Army Anthropometry.*

[19] Based upon numerous studies, including especially the Report of the Anthropometric Committee, and the works of Beddoe, Fleure, and Parsons. A limited bibliography of general works on Great Britain which include hair color studies, and of specific works on England and Wales, follows:

Anonymous, *Report of the Anthropometric Committee*, **RBAA**, Sess. 49, 1880, pp. 175–209.

Anonymous, *Final Report of the Anthropometric Committee*, London, 1883.

Beddoe, J., *The Races of Britain; The Physical Anthropology of the Isle of Man; On the North Settlements of West Saxons;* **JRAI**, vol. 27, 1898, pp. 164–170; vol. 34, 1904, pp. 92–

that of total pigmentation as shown on Map 8. In England, black hair ranges from nearly 0 to 10 per cent, except in Devonshire and Cornwall, where it reaches a maximum of 20 per cent in the region of Penzance. Along the eastern coast it is extremely rare, and the average for the country is probably between 4 per cent and 5 per cent. Dark brown hair accounts for 14 per cent to 43 per cent of the population in the different parts of England. In general, it runs below 30 per cent in the regions of intensive Saxon and Danish occupation—that is, Lincolnshire, Norfolk, Suffolk, and Yorkshire—while it averages above 30 per cent in the west, and has a mean of approximately 40 per cent in Cornwall. Brown hair, a light-to-intermediate hue, ranges from 57 per cent to 24 per cent, and has a distribution precisely opposite to that of dark brown hair, which may be considered intermediate-to-dark. On the whole brown is more prevalent than dark brown, and the blond element is considerably more important than the brunet one among the English. Fair hair, representing golden, ashen, and also light brown hues, varies from 5 per cent to 47 per cent. Well over 25 per cent is typical of the North Sea coast, while in Cornwall it runs from 10 per cent to 15 per cent. Among English blonds, golden hair is far commoner than the ashen variety, but ash-blondism is by no means absent, nor as rare as in Ireland.

99; **MASL,** vol. 2, 1866, pp. 37–45, 348–357; **AR,** vol. 1, 1863, pp. 310–312; **RBAA,** vol. 41, 1872, p. 147.
Bradbrooke, W., and Parsons, F. G., **JRAI,** vol. 52, 1922, pp. 113–126.
Davies, E., and Fleure, H. J., **JRAI,** vol. 46, 1936, pp. 129–188.
Dunlop, A., **JRAI,** vol. 22, 1893, pp. 335–345.
Eickstedt, E. von, **ZFRK,** vol. 1, 1935, pp. 19–64.
Fleming, R. M., *Man,* vol. 22, 1922, pp. 69–75.
Fleure, H. J., *The Races of England and Wales.*
Fleure, H. J., and James, T. C., **JRAI,** vol. 46, 1916, pp. 35–154; **RBAA,** vol. 80, 1910–11, pp. 726–727.
Flower, W. H., Garson, J. G., Bloxam, G. W., Haddon, A. C., and Smith, W., **RBAA,** vol. 63, 1893–94, pp. 654,661.
Flower, W. H., Garson, J. G., Bloxam, G. W., Haddon, A. C., and Windle, B., **RBAA,** vol. 64, 1895, pp. 444–453.
Fox, A. L., **JRAI,** vol. 6, 1887, pp. 443–457.
Freire-Marecco, B., *Man,* vol. 9, 1909, pp. 99–108.
Goring, C., *The English Convict.*
Grünbaum, O. F. F., **RBAA,** vol. 67, 1898, pp. 505–506.
Haddon, A. C., **RBAA,** pp. 503–504.
Muffang, M. H., **Anth,** vol. 10, 1899, pp. 21–41.
Moore, A. W., and Beddoe, J., **JRAI,** vol. 27, 1897, pp. 104–130.
Parsons, F. G., **JRAI,** vol. 50, 1920, pp. 159–182.
Pearson, K., and Tippett, L. H. C., **Biometrika,** vol. 16, 1924, pp. 118–138.
Pitt-Rivers, A. H. L., **JRAI,** vol. 11, 1882, pp. 455–471.
Shrubsall, F. C., **RSBH,** vol. 39.
Taylor, J. J., **RBAA,** vol. 67, 1898, pp. 507–510.
Walk, C. S., **TYNU,** 1886.

In Wales, 10 per cent of the total have black hair, and only 8 per cent are fair in the English sense. Dark brown predominates over medium brown, while red, which averages 5 per cent, runs as high as 9 per cent in small localities. Beddoe finds as much as 86 to 89 per cent of black and dark brown hair in such places as Newquay and Denbighshire Upland. On the whole, Wales, in accordance with its mountainous character and its general preservation of ancient cultural traits, is a region of strong local variability, which manifests itself particularly in pigmentation.

In Scotland, the systematic study of 7000 adult males and of half a million schoolchildren[20] makes our knowledge of the regional distribution of hair color relatively complete. Black hair ranges among adults from 0 to 8 per cent by counties, but nowhere attains the figures observed in Cornwall, Devonshire, and Wales. Dark brown hair accounts for 38 per cent of the population; the medium to light brown shade, with 42 per cent, is the most numerous; fair hair runs to 11 per cent, and red to 5 per cent.

Tocher finds that jet black hair is commoner in the western highlands than elsewhere, and is statistically correlated with the greatest survival of Gaelic speech. But since Gaelic was brought from Ireland in the Christian era, and the Goidelic Kelts of Ireland were not notably black haired, this brunet condition must be due to an earlier racial element. That black hair and Keltic speech both survive in Wales, furthermore, does not mean that the two were originally associated, for Kymric had been spoken in Wales only a few hundred years before the Saxons came. The western lowland counties of Scotland, which include the ancient Kymric kingdom of Strathclyde, are no darker in hair color than the rest of Scotland.

The eastern Scottish coast, from Caithness to Berwick, shows little of this black hair, and in general the areas of both Pictish and Saxon concentration are quite deficient in it. This finding should dispel the idea

[20] See especially the works of Tocher and of Gray in the following limited bibliography of works on Scotland which include hair color data.

Beddoe, J., **JRAI,** vol. 38, 1908, pp. 212–220.
Cooper, J., **RBAA,** vol. 67, 1898, p. 507.
Duncan, J. W., **RBAA,** p. 506.
Forbes, A., **RBAA,** p. 506.
Gray, J., **RBAA,** vol. 69, 1899–1900, pp. 874–875; **JRAI,** vol. 30, 1900, pp. 104–124; vol. 37, 1907, pp. 375–401.
Gray, J., and Tocher, J. F., *The Ethnology of Buchan;* **JRAI,** vol. 30, 1900, pp. 86–88.
Gregor, W., **RBAA,** vol. 67, 1898, pp. 500–502.
Macleay, K. S., **RBAA,** p. 507.
Reid, R. W., and Mulligan, J. H., **JRAI,** vol. 54, 1924, pp. 300–313.
Smith, J., and Gardiner, J. B., **RBAA,** vol. 67, 1898, p. 507.
Teit, J. A., and Parsons, F. G., **JRAI,** vol. 53, 1923, pp. 473–483.
Tocher, J. F., **TBFC,** 1897, pp. 1–16; **Biometrika,** vol. 5, 1906–07, pp. 298–350; vol. 6, 1908–09, pp. 129–234; **HTR,** Edenburgh and London, vols. 2 and 3, 1924.

that the Picts were a notably brunet people. Fair hair is commonest in the east, in both highlands and lowlands, and is especially prevalent in the very northeastern corner, and in the Orkneys and Shetlands, where much of the blood is Scandinavian.

In the cities of Scotland some important facts in regard to hair color have been uncovered. While Edinburgh and Aberdeen have relatively fair populations, and reflect the pigment character of the populations around them, Glasgow, which is not only the largest city in Scotland but also the second largest in the British Isles, is notable for a heavy concentration of dark brown hair, which seems distinctive not only of the city itself but also of the thickly settled manufacturing district which surrounds it. Tocher, who has made an exhaustive study of the city by sections, finds that while dark hair is commonest in the poorer districts and in the portions of the city which contain the largest ratio of foreign population, it cannot be entirely attributed to foreign blood, which is in the minority everywhere.

In the Glasgow district, as in the Midlands, slum conditions and factory existence have brought about a reëmergence of the older Mediterranean element in the population, submerged since the Neolithic; although published evidence from the English Midlands which will confirm this is as yet lacking, there can be no doubt of the general accuracy of this conclusion. The study of other criteria from Scotland will confirm it in regard to the Glasgow district.

Whereas the British are on the whole lighter haired than the Irish, they are at the same time darker eyed. The difference is not, however, a great one, and in both England and Scotland blue and light-mixed eyes are in the majority.[21] Since the pigment division of Great Britain runs north and south, the total eye color classes of both Scotland and England-plus-Wales are nearly identical, and regional variations follow those of hair color.

In only one published British series was a Martin eye color chart used—that of von Luschan's British scientists, a highly selected group of 84 men returning from a scientific congress in Australia.[22] Of this group, which included Charles Darwin the younger, 29.8 per cent had pure light eyes (Martin #15–16); 27.4 per cent light-mixed eyes (Martin #12–14); 2.4 per cent pure dark eyes (Martin #1–4); while the remaining 40.4 per cent had medium- or dark-mixed irises. According to most European standards the total of lights would be considered 57 per cent. This small series is as

[21] Sources same as for skin color and hair color, and also:
Galton, E., **JRAI,** vol. 28, 1889, pp. 420–430.
Pitt-Rivers, Garson, and Bloxam, **RBAA,** vol. 59, 1889–90, pp. 423–435.
[22] Luschan, Felix and Emma von, **ZFE,** vol. 46, 1914, pp. 58–80.

light eyed as some of the Norwegian coastal groups, but not as light as most of Scandinavia, or as Ireland.

In the large, regional studies of British eye color, 62 per cent of English are called light eyed, and 34 per cent dark. On this basis the fishermen of the English North Sea coast have as much as 90 per cent of light eyes, and, at the same time, the Cornish run as low as 55 per cent. Other ratios of 55 per cent to 60 per cent occur in towns and cities scattered throughout England, and seem typical of urban populations. The Cornish, who are the darkest eyed of the English, are still predominantly a light-mixed-eyed people, as are the English as a whole. No typically brunet population may be found in England.

Wales, however, is notably darker eyed. Out of Beddoe's series of 3000, 34 per cent are called brown eyed, 15 per cent mixed, and 51 per cent light. Although the light-eyed element is still the more numerous in the principality as a whole, it is possible to distinguish typically dark-eyed districts. Fleure found between 60 per cent and 70 per cent of "dark" eyes in Llandyssul, Newquay, and Denbighshire Upland, and Beddoe found the same among the Abergavenny country people, among the townsmen of Brecon, and in Merthyr and Taffvale. These are all isolated regions, and the antiquity of dark eye color in Wales is evident.

In Scotland, 32 per cent of adult males have pure light eyes, 48 per cent are called mixed, and 20 per cent dark. The latter category probably includes a number of dark-mixed iris patterns. Blue eyes are commonest in the north and south of Scotland, and gray eyes appear in numbers in the Shetlands and Orkneys, under Scandinavian inspiration. Mixed eyes are typical of east central Scotland, while brown eyes reach their highest ratio in the Glasgow region, among the industrial population. The area of Gaelic speech, which Tocher found associated with an excess of dark hair, is also notably blue eyed.

The general pigment character of Great Britain, as shown on Map 8, is predominantly light mixed. Fair, vascular skin, medium brown hair, an excess of rufosity and freckling, and blue or light-mixed eyes are typical of the British as a whole. This pigment combination without doubt reflects the coloring of the Iron Age Kelts, who have made the greatest single contribution to the present British population. Blondism of Scandinavian intensity, reflecting Saxon and Danish influence, is characteristic of the whole eastern coast of England and Scotland, while a strong brunet survival in Cornwall and Wales indicates the presence of a pre-Keltic population of considerable intensity. The industrial revolution, which has fostered dense under-privileged populations in the Midlands and on the Clyde, has enormously increased, by some selective process, the darker-haired and darker-eyed elements in Britain. In general, differences in

social level and in occupation reflect racial differences, which show themselves to a certain extent in pigmentation. The upper social strata, being on the whole blonder, follow the pigment pattern of the Saxons, Danes, and Normans. This differentiation may well have been even stronger in the Middle Ages, when social lines were more strictly and overtly drawn than today. The Englishman who travels abroad and is seen by foreigners, and the one whose photograph frequently appears in the London Illustrated News, is more likely to be blond than the general run of his more obscure compatriots who stay at home, and whose faces are publicly depicted only when they have committed crimes.

The regional variations of stature in Great Britain may be observed with sufficient accuracy on Map 5. The mean for the whole island is approximately 172 cm.,[23] which is comparable to Ireland, and to Norway and Sweden. On the whole, Scotland is taller than England, and England taller than Wales. The blond Saxon-Danish strip of country along the North Sea shore, from Scotland through Suffolk, is the tallest part of England, as tall as most of Scotland; while the counties bordering on the Thames estuary and the Channel are taller than those immediately inland. In western England and in Wales, shorter stature is not regionally associated with the most brunet pigmentation. Cornishmen are the tallest of the British west of Berkshire, while the shortest stature in Britain by counties is found, not in the brunet districts of central Wales, but in the mining country of south Wales, in the counties bordering the inner section of the Bristol Channel, in Shropshire and Hereford, and in the counties immediately adjoining London. In no county, however, does the mean fall below 168 cm. although in individual villages in Wales it is as low as

[23] References to stature may be found in most of the previously noted works referred to in this section. In addition to these, the following list may be mentioned:

Anonymous, **RBAA,** vol. 48, 1879, pp. 152–155; vol. 51, 1882, pp. 225–272.

Beddoe, J., **Anth,** vol. 5, 1894, pp. 513–529, 658–673.

Cripps, L., Greenwood, R., and Newbold, E. M., **Biometrika,** vol. 14, 1922–23, pp. 316–336.

Downes, R. M., **JAPL,** vol. 48, 1914, pp. 299–309.

Elderton, E. M., **Biometrika,** vol. 21, 1929, pp. 429–430.

Fleure, H. J., **JRAI,** vol. 50, 1920, pp. 12–40.

Fox, A. L., **JRAI,** vol. 5, 1875, pp. 101–106.

Greenwood, R., Thompson, C. M., and Woods, H. M., **Biometrika,** vol. 17, 1925, pp. 142–158.

MacDonnell, W. R., **Biometrika,** vol. 1, 1901–02, pp. 177–227.

Marshall, J., **JAPL,** vol. 26, 1892, pp. 445–500.

Peate, I. C., **JRAI,** vol. 55, 1925, pp. 58–72.

Pitt-Rivers, Garson, and Bloxam, **RBAA,** vol. 60, 1890–91, pp. 549–552.

Reid, R. W., and Mulligan, J. H., **JRAI,** vol. 46, 1912, pp. 1–10; vol. 54, 1924, pp. 287–300.

Schuster, E., **Biometrika,** vol. 8, 1911–12, pp. 40–51.

Venn, J., **JRAI,** vol. 18, 1888, pp. 140–154.

165 cm.[24] In Scotland a belt of relatively short stature running from 169 cm. to 171 cm. stretches across the country diagonally from the Clyde to the Forth, and includes the Glasgow industrial area.

The mean stature of England and Wales appears to have increased from about 170 cm. in 1865, to its present level of over 172 cm.[25] At the same time, that of the Scotch may have shrunk in certain areas, although Scotland as a whole has probably increased.[26] The general British increase may be traced in different social classes as well as in regional populations. Cambridge students in 1888 had a mean stature of 175 cm., Oxford, in 1911, of 177 cm. During the first quarter of the present century, English convicts rose from 166 cm. to 168 cm.

In England as in Sweden, social and occupational differences in stature are greater than regional differences.[27] As early as 1880, the mean for the nobility and for professional men and financial leaders was 174.4 cm.; between them and the next tallest group, clerks and shopkeepers, was a drop to 172.6 cm.; farmers and road workers followed with 171.5 cm.; factory workers, miners, laborers in general, and seamen all had occupational means of under 170 cm., while convicts, at the bottom of the list, averaged only 166 cm. Among Goring's English convicts, those coming from destitute family surroundings had a mean stature of 161 cm., those from well-to-do families 167.7 cm., with others graded between.[28]

The English are, on the whole, equal in weight to the Irish, or slightly lighter, and show as great a class differentiation in this character as in stature. Oxford and Cambridge students, who are for the most part under 25 years of age, have means of 155 lbs., while prison inmates vary from 132 to 154 lbs. in accordance with differences in home environment. Heavy weights are common on the east coast, as at Flamborough, Yorkshire, where a mean of 168 lbs. has been recorded; in Leeds and in Cardiff the mean is 156 lbs. The bodily proportions of English and Scotch are on the whole indicative of a linear to somatic, or "athletic," constitutional form. The relative span is as a rule around 102 and 103, comparable to the Nordic means for eastern Norway and Sweden. These low span ratios are due not to narrow shoulders but to relatively short arms. The relative sitting heights of 52 to 53 are slightly shorter than those of the Irish, and again similar to those of Scandinavian Nordics. The hips are moderate

[24] Eickstedt, E. von, **ZFRK**, vol. 1, #1, 1935, pp. 19–64.

[25] Using the two American army figures as end points, and the British Association report for 1883.

[26] The 1883 British survey gives a mean of 174.6 cm. for 1304 Scotsmen; Tocher, 40 years later, found a mean of 171.5 cm. for a series of 3474. The United States Army figures for the Civil War are: 4822 Scotch, Stature = 171.5 cm.; World War, 2074 Scotch, Stature = 172.5 cm.

[27] Roberts, C., *Manual of Anthropometry.*

[28] Goring, C., *The English Convict.*

for Europeans, with bi-iliac means of 28–30 cm., and narrow in proportion to the shoulder breadths.

Since the Mesolithic the British have possessed, even during the Bronze Age, heads of unusual length. Hence it is not surprising to find that the modern English, Welsh, and Scotch exceed most European groups in this respect. Only in western Norway, Iceland, and Ireland can they be equalled. The mean for each of the three British groups is approximately 195 mm.[29] In England most of the differences known are social rather than geographical; university students and men of science have means ranging from 196 mm. to 199 mm., while criminal means run as low as 191 mm. In Wales the head length varies regionally from 192 mm. in Montgomeryshire to 198 and 199 mm. in Cardiganshire and Cardiff. Extreme lengths which approach the 200 mm. mark are mostly confined to isolated, rural groups. In Scotland the greatest lengths appear in the far north, and the least in the industrial trough from the Clyde to the Forth.

For all its length the English head is not especially narrow, since a general mean for the country would approximate 153 to 154 mm. In Wales the narrower mean of 152 mm. is found for the entire principality. Although in some parts of Wales the heads are as broad as in England, in others, such as Montgomeryshire and Carmathen, the means fall to 148 and 149 mm. In Scotland a total mean of about 152 mm. applies to the civil population,[30] but there is a difference of 4.4 mm. between the means for Aberdeen and Banffshire (153 mm.), at one extreme, and that for Dumbarton (148 mm.) at the other. In general, the northern Scottish counties are broader headed than the industrial districts and the lowlands.

As Ripley stated some forty years ago, the cephalic index is one of the least variable physical traits in the British Isles. England, Scotland, and Wales are all fundamentally mesocephalic, and no regional mean falls below 76 or rises above 80. On the whole, Great Britain is narrower headed than Ireland, and the British resemble the eastern Irish and the Irish Protestants in this respect. As Map 6 shows, the lowest cephalic indices are to be found in Wales and in the Midlands, and also in the lowlands and industrial districts of Scotland, while the highest occur in

[29] Many of the preceding references contain data on head length, head breadth, and the cephalic index. The following may be added:

Beddoe, J., **Anth,** vol. 5, 1894, pp. 658–673.

Parsons, F. G., *Man*, vol. 22, 1922, pp. 19–23.

Gladstone, R. J., **JAPL,** vol. 37, 1903, pp. 333–346; vol. 51, 1921, pp. 343–369.

Griffiths, G. B., **Biometrika,** vol. 4, 1904, pp. 60–62.

[30] Tocher, J. F., 1924. Tocher's means for soldiers are over a millimeter less than for the civil population, and the same is true in regard to head length. His total Scotch means for soldiers are: Head Length = 193.0 mm., Head Breadth = 150.3 mm.

the north of Scotland, where a minor survival of Bronze Age brachycephaly is suggested. High indices in the Orkneys and Shetlands may rather imply the settlement of Vikings from southwestern Norway.

Measurements on the head height and on the facial dimensions of British are not numerous enough or sufficiently standardized to be satisfactory. Minimum frontal means range from 105 to 110 mm.; the bizygomatic diameter is narrow (136–137 mm.) among criminals, broad (144 mm.) among scientists; in Wales local means of 139 and 140 mm. are found, in the north of Scotland, of 140–142 mm. Bigonials follow the minimum frontal, and range from 105 to 109 mm. These breadth dimensions fall within Norwegian and Irish ranges, and seem for the most part essentially Nordic. Both foreheads and jaws are too broad for most Mediterraneans. Face heights of 122 to 126 mm. confirm this Nordic association. The noses are longer and narrower than those of the Irish, as a rule, and nasal indices of 62 to 65 are comparable to those in Scandinavia. There seem to be no perceptible regional variations in this respect, as far as one can tell from available data.

The results of this extremely unsatisfactory survey of the facial characters of the English, Welsh, and Scotch are that all three seem to be very much the same; the face is typically moderate in width, and of more than average European length. The forehead and jaw diameters are relatively great, and give to the face a parallel-sided appearance. The nose is leptorrhine and of normal European dimensions. The facial dimensions are on the whole Nordic, and fall between Irish and eastern Norwegian means.

If metrical constants aside from stature, length, and head breadth are scarce, observational statistics on the British are even less satisfactory.[31] Like the Irish, the British appear normally equipped for Europeans in body hair and in degree of beard development. In hair form, the majority are usually recorded as straight, the rest mostly as wavy; on the whole the English, at least, are probably straighter haired than the Irish. Although the Silures of Wales were said by the Romans to have had curly hair, there is no evidence from Wales to show that this hair form is especially common. On the whole the British hair is finer in texture than that of many Europeans.

Among the English, Welsh, and Scotch internal and median eyefolds are very uncommon, while external folds are not infrequent. Thick eyebrows, characteristic of the Irish, are also found among the Scotch, especially in old age. Concurrency of the eyebrows is found in only 30 to

[31] Almost entirely limited to Hooton's British-born convicts in American jails, Goring's convicts, and a series of 32 Shetland Islanders emigrating to Canada. (Teit, J. A., and Parsons, F. G., **JRAI**, vol. 53, 1923, pp. 473–483.)

40 per cent of British; in Goring's criminal series it is linked with dark hair color. Among the British browridges of all normal European degrees are found, and on the whole the development is medium, with a large minority of prominent forms.

The slope of the forehead is frequently pronounced, as is typical of the Keltic Iron Age crania, and as may be seen from the composite silhouettes of English men and women shown in Fig. 32. The nasion depression is

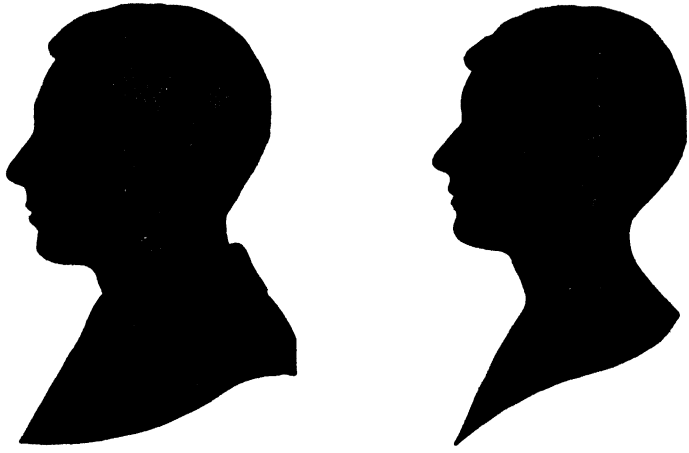


FIG. 32. COMPOSITE SILHOUETTES OF ENGLISH MEN AND WOMEN.
After McLearn, Morant, and Pearson, Biometrika, vol. 20b, 1928–1929, Plates 2 and 3.

characteristically slight, and the root of the nose high and narrow. The bridge is as a rule also high, and of narrow to moderate breadth. Straight nasal profiles are found in from 50 per cent to 80 per cent of cases, and the second most numerous category is wavy or concavo-convex, which runs as high as 40 per cent and averages 25 per cent of the whole. This type of profile is produced by a prominence of the nasal bones, the formation of a slight angle between their extremities and the cartilage, and an elevation of the tip lobes slightly above the cartilage level. From the Nordic standpoint, this type of nose is closer to the Trøndelagen type in Norway than to the classic Nordic of the eastern valleys; it is also associated in antique sculpture with representations of the Kelts. The Dying Gaul, for example, has a nose of this type. Concave noses are much rarer than in Ireland, and of the large convex minority, the angular or humped variety is the usual type, and the smoothly convex form is infrequent.

Lips seem to be thin to medium and little everted, chins strongly developed, but not to the degree found in western Ireland. Temples, malars, and gonial angles are as a rule compressed. All in all the scanty picture which our material gives us substantiates the impressions drawn from

life. Although the British are quite variable in facial form, the features by which a foreigner would remember them would be a longness and narrowness of head and face, floridity, and a pinched prominence of the nose.

It is possible to make a number of correlations within some of the numerous series upon which our knowledge of British physical anthropology is based.[32] Brunet hair and eye color uniformly go with a lower cephalic index than does light pigmentation. This reflects the fact that the Neolithic peoples had a cranial index of 72 and lower, while both varieties of Nordic have cranial means of 75. There is no evidence of a brunet round-headed type except in one series from the Chiltern Hills, in Oxfordshire, where dark complexion is positively associated with great head breadth. In Caithness and Sutherland, in the Scottish Highlands, pure light complexion is linked with great head breadth, indicating that the broad-headed factor is in this case probably Borreby in origin. In western Ireland four correlations indicate the same linkage, confirming the supposition that a broad head is borne by the Palaeolithic element.

In Cardiganshire in west central Wales, a selected group of 520 men with black or dark brown hair had a mean cephalic index of 74.6, and a stature of 167 cm. The index would be about 72 on the skull, which is the mean for the Long Barrow type of the Neolithic, and furthermore, the stature is comparable. Similarly in a Scottish Highland series [33] dark haired men have a mean cephalic index of 77.7, fair-haired ones of 78.1. The brunets have a mean head length of 196.7 mm., the blonds of 193.9 mm. In Elgin and Nairn, similarly, absolutely greater head lengths go with mixed and dark complexion.

These correlations on the whole show that a brunet racial type characterized by an extremely long cranial vault and moderately tall stature has retained its identity in the peripheries of Great Britain, notably in Wales and the Scotch Highlands, while the more numerous Nordic elements are characterized by a more moderate head length and mesocephaly. They also show that brachycephalic strains which have entered into the British racial composition must have been largely blond, although there is evidence of a minor element of brunet brachycephaly in one local instance.

If specific data for racial description is scanty in Great Britain, both the author and the reader can largely supply that deficiency from common observation. The most frequent type is a Nordic variety, as described

[32] Scheidt, in a lengthy and thorough survey of the published series, made 2 racially significant correlations in England, 2 in Wales, 6 in Scotland, and 4 in Ireland.
Scheidt, W., **ZFMA**, vol. 28, 1930, pp. 1–198.

[33] Gray, J., and Tocher, J. F., *The Ethnology of Buchan.*

above; but it is well known that other types are by no means rare. The thick-set, wide-faced, and large-nosed type, so common in caricature under the guise of John Bull, must be derived from the larger brachycephalic element brought in by the Bronze Age invasions; it is a British form of the continental Borreby race. In the fishing villages of the Yorkshire coast, where local dialects are spoken in which much Scandinavian still remains, and where the older fishermen still wear T-shaped amulets around their necks reminiscent of Thor's hammer, pure Norwegian and Danish physical types are common, and the same is true in the Orkneys and Shetlands.

Cornwall, which is the darkest county in England and an ancient Keltic linguistic stronghold, contains, like Wales, strong vestiges of a pre-Keltic population. That this is not a short Mediterranean variety, on the whole, is shown by the fact that the stature of Cornwall is relatively tall, and the mean cephalic index of the duchy not particularly low. A large-bodied, muscular type, with a head which is frequently brachycephalic, is common here, and must be attributed to the Bronze Age invasions. It has been claimed, without statistical evidence,[34] that there is a special racial type among the fishermen and sailors who live in the seaports of Cornwall, Devonshire, Somerset, and South Wales, but especially in Cornwall. Besides having medium or tall stature, and a tendency to brachycephaly, they are said to be heavy-bodied, lateral in build, thick-necked, with features of a somewhat Armenoid cast, dark, curly hair, thick eyebrows, and eyes which are frequently brown.

This type is recognized in local Keltic tradition, and according to one legend, is said to have been brought from Troy. It may also be associated with the strong local belief that the Cornish are descended from Phoenicians. That there is such a type cannot be proved without metrical evidence, but it will be recognized by most persons familiar with this part of England. It can also be found in Massachusetts among old Cape Cod families whose ancestors came from Cornwall and Devon.

The most difficult local British type to study, with present materials, is the long-headed brunet population of the remoter districts of Wales.[35] It is evident, however, that under the category of brunet dolichocephals there are actually several racial types of different origins which have been preserved by the marginal geographical nature of this country, as have the more easily identified Beaker types of more recent arrival.

In the first place, the work of Fleure and James on the Plynlimon moor-

[34] Andrews, T. H., **Man,** vol. 21, 1921, pp. 137–139.
[35] Eickstedt, E. von, **ZFRK,** vol. 1, 1935, pp. 19–64.
Fleure, H. J., *The Races of Britain and Wales.*
Fleure, H. J., and James, T. C., **JRAI,** vol. 46, NS. 19, 1916, pp. 35–153.
Peate, I. C., **JRAI,** vol. 40, 1925, pp. 58–72.

lands people of Cardiganshire, an isolated group who live for the most part as shepherds, shows that this region is the center for all Wales of the greatest concentration of brunet dolichocephaly; their work also indicates that a primitive human type, with large browridges, a low vault, a projecting occiput, sloping forehead, a broad face, and prognathism survives here, and is to be found in solution throughout most of Wales. That this type is a survival from pre-Neolithic times seems reasonable. The head lengths associated with it run well over 200 mm., in many cases over 210 mm., and the stature is usually under 170 cm. The moderate stature, the narrow vault breadth, and the brunet pigmentation, as well as the general morphological character, prevent this type from being closely associated with the large-headed northern Palaeolithic sub-stratum in Ireland; one is reminded rather of the early Combe Capelle skull, and to a lesser extent, of the Mesolithic men of Téviec in Brittany.

The majority of the brunet dolichocephals, however, belong rather to the Long Barrow race of Megalithic introduction from the eastern Mediterranean shorelands. A selected group of 46 men from all parts of Wales, but in many cases from the neighborhood of the Plynlimon district, with cephalic indices under 73.0, have a mean head length of 201 mm., a breadth of 144.2 mm., and a stature of 168.0 cm. If this dolichocephalic element were predominantly a small Mediterranean, one would expect both the head length and stature to be much less than they are. Many other series from other parts of Wales confirm the general head form character of this predominant dolichocephalic brunet element. That it has absorbed the earlier Mesolithic or Palaeolithic type is likely, for there is nothing in the English Long Barrow crania to indicate the importation of such a primitive variety as an end type.

If we consider that the Long Barrow type was in original form almost purely brown eyed, then it must be less important in the racial structure of Wales than the Keltic Iron Age Nordic, for in but few districts are brown eyes in the majority. It is possible, however, here as in Ireland, that there was an incipient blue-eyed condition among the Long Barrow people, as among living North Africans who belong to a closely similar type, and that in northwestern Europe this condition was increased through stimuli similar to those which produced blondism among other races.[36]

Among individual Welshmen it is possible to pick out individuals of a smaller Mediterranean type, similar to that of Spain and Portugal, and suggesting a survival from the Neolithic peoples of Windmill Hill cultural affiliation who entered southern Britain from the continent. This type is also easily isolated in the Midland factory districts, and among the Glasgow population. In Wales, however, it is difficult to separate it from the Long

[36] Eickstedt, E. von, **ZFRK**, vol. 1, 1935, pp. 19–64.

Barrow type, with which it is frequently associated. Von Eickstedt's series of 30 men from Llangynog in North Montgomeryshire, and from Kerry in the southern part of the same county, furnish the best anthropometric evidence of its presence. In both regions brunet pigmentation is characteristic; both series are mesocephalic. The mean stature of the Kerry men is 166.5 cm., of the Llangynog group 168.2 cm. The first mean is low enough to indicate a strong Mediterranean element. The head and face measurements, however, of both groups are much alike, and too great for a small Mediterranean series; the head length mean is 196 mm. in each, the breadth 154; the mention-nasion face height is 124 mm. in Kerry, 125 mm. in Llangynog; the bizygomatic of Kerry 140 mm., that of Llangynog 139 mm. The noses of each are roughly 55 mm. by 34 mm., the nasal indices—61.8 for Kerry, 62.8 for Llangynog.

The head breadth, face height, and face breadth are all a little too great for a small Mediterranean type, but an examination of the distribution curves of the two series eliminates this difficulty. The stature is strongly bimodal, with a smaller mode at 163 cm., and a larger peak at 169 cm.; head length has modes at 193 and 199 mm.; head breadth at 151 mm. and 157 mm.; the facial index at 86 and 92; the nasal index at 59 and 67. If we grant the small Mediterranean type a mean stature of 163 cm., a head length of 193 mm., and the lower facial and higher nasal indices, it assumes a metrical character which can easily be duplicated in the countries in which this type is more numerous and more easily identified, for example, Arabia and North Africa.

The pursuit of these early brunet survivals in remote districts of Wales must not, however, make us forget that the bulk of the evidence from that country as a whole indicates that the variety of Nordic to which the bearers of Kymric speech belonged is today nearly if not fully as important there as the totality of earlier human varieties.

(4) THE BRITISH ISLES, SUMMARY

The racial history of the British Isles, reviewed in the first section of the present chapter, is a more complicated matter than one would expect in view of the marginal position of these islands. Its complexity serves to illustrate the little appreciated fact that men of European racial type began navigation in a serious way while still limited to the tools and resources of a Neolithic economy; and that even at that remote time navigation was a primary means by which large populations were transferred between distant points. The population of the British Isles has been drawn from a number of widely separated regional sources, and the sea has served not so much as a barrier as a highroad over which these diverse elements have converged.

These elements include most of the known branches of the white race; one or more varieties of unreduced or unaltered Palaeolithic man; two varieties of brunet Mediterranean, of which the sea-borne Atlanto-Mediterranean is the more important; the two principal surviving variants of the Iron Age Nordic group; brachycephals of Dinaric or Armenoid type, as well as the composite Beaker type which is a blend of Dinaric, Borreby, and early Corded elements.

The snub-nosed Neo-Danubians and East Baltics, the brunet hook-nosed Irano-Afghans, may for practical purposes be considered absent, while the Alpine race, that important bearer of brachycephaly in central Europe from France to the Bosporus, and over into the highlands of western Asia, is notably uncommon. Individuals of apparent Alpine type are, in most cases, Borreby descendants. It is the virtual absence of Alpines in the British Isles which has prevented the British from undergoing a brachycephalization comparable to that found in most of central Europe. There seem to be no dominant trends in head form, for the component elements in the British racial amalgam have retained their original cephalic index levels.

In both Great Britain and Ireland, the invasion of the Keltic Iron Age Nordics was the event which brought in the largest single body of people, and the British of today, by and large, owe more in a physical sense to these Kelts than to any other group of invaders. In both Great Britain and Ireland, the Neolithic and Bronze Age invasions were of secondary importance in respect to the present population, as were the invasions of Germanic-speaking peoples.

In the different countries which make up the British Isles, these various minorities have differential values in the local populations. It is these minority differences which separate the English, the Scotch, the Irish, and the Welsh, while the community of the Iron Age Nordic element serves as an opposing force to hold them together.

In England, the Germanic element is the most distinctive; in Wales it is the Atlanto-Mediterranean; in Scotland it is a combination of Bronze Age and Scandinavian elements in the northeast, of Irish with Atlanto-Mediterranean in the west; in Ireland the one fact of greatest importance is the reëmergence of the old northern Palaeolithic stock. The Keltic Iron Age racial type is least important in northeastern Scotland, where Keltic speech never penetrated, and in Wales, where it has attained its maximum survival.

PHOTOGRAPHIC SUPPLEMENT

Photographic Supplement [1]

INTRODUCTION

The photographic supplement which follows has been arranged in such a manner that it may serve both to illustrate the text of Chapters VIII through XII, and to summarize the material of the book as a whole. The basic theses of the book, which these pictures illustrate, are:

(1) The living members of the white race who occupy Europe and the adjacent portions of Asia and Africa owe their initial differentiation to a dual origin.

(2) Some are descended primarily from the hunters and food-gatherers who occupied frigid, sub-glacial lands at the time of the last Würm advance. These hunters and food-gatherers were in turn descendants of Neanderthaloid-*sapiens* hybrid ancestors.

(3) Others are descended primarily from the purely *sapiens* Mediterranean peoples, who had never, during the Glacial Period, seriously encountered the cold, and who, in post-glacial times, developed agriculture and animal husbandry as a primary means of subsistence. The Mediterranean peoples began colonizing Europe from the east and south about 3000 B.C.

(4) Still others, and in Europe these form the most numerous group of all, represent clearly differentiated hybrid forms, indicating descent from both of the two stocks mentioned above. These hybrid forms follow well-marked metrical and morphological racial patterns, in accordance with definite biological principles. (See Plate 35 seq.)

(5) All mixture does not produce these forms, however, since most if not all of Group A or Palaeolithic phenotypes must from a genetic standpoint represent reëmergences.

(6) The racial map of Europe is never constant; there is always change, due to (a) environmental conditioning, (b) migration, (c) socially and economically conditioned racial selection both in migratory and in geographically static populations.

In the following pages the scheme will be to deal first with the descendants of the Late Pleistocene inhabitants of the white racial area, then with those of the Mediterranean race in its various forms, and finally with mixed types combining the characters of A and B.

Anthropometric specifications of the subjects will be found in the tables which follow the plates.

[1] The pictures which appear on the following plates have been collected from many sources. All which are not otherwise accredited were taken by the author either in the United States or abroad. The author wishes to express his gratitude to the subjects who permitted him to photograph and measure them, and who stated their willingness to have their pictures appear in this book; he assures them that whatever remarks may appear in reference to their physical characters are concerned with racial and historical matters only; there is no implication of superiority or inferiority, intellectual, moral, biological, or otherwise, in any case. No pictures of convicts or of other persons socially stigmatized have been knowingly used. The sole object of the author in compiling this supplement has been to cover as well as possible the range of racial variation within the white group.

The following individuals, other than the two New Englanders specified as such, the American-born English Gypsy, and the Jews whose American birthplaces are specified, were born in the New World of parents from the places mentioned. Plate 5, Fig. 5; 9–4; 9–7; 22–3; 22–4; 23–1; 23–3; 26–4; 27–1; 27–3; 30–4; 32–3; 33–4; 37–2.

Plate 1

LAPPS AND SAMOYEDS

During the Late Pleistocene and the post-glacial Mesolithic cultural period, descendants of Upper Palaeolithic hunters lived in North Africa, in most of Europe, and in western Siberia, where some of them merged into the ancestors of the mongoloid group of humanity. Even during the Upper Palaeolithic cultural period in western Europe, some of the hunting peoples showed incipiently mongoloid racial tendencies. Among the living descendants of these hunters, these tendencies are more common in the eastern groups than among those living in the west.

Aside from the Ainu, the Lapps represent the easternmost in locus of development of the basically white hunting groups which survived, and the only one which retained a non-agricultural economy until modern times. Their present location in northern Scandinavia and the Kola Peninsula is probably recent, and their area of differentiation is believed to have been situated in the neighborhood of the Urals.

FIG. 1 (3 views, Lundborg and Linders, *The Racial Characteristics of the Swedish Nation*, Plate 28). This Swedish Reindeer Lapp from Jämtland shows no evidence of Nordic or other non-Lappish admixture; he may be taken as the closest approximation to a Lappish prototype which may be found. Like the Lapps as a whole, he is short-statured, small-bodied, small-headed, and brachycephalic. His morphological resemblance to the Alpine race is striking; he is less mongoloid in appearance than some others of equal purity.

Fig. 2 (1 view, photo Martin Luther). An unmixed coastal Lapp from Norway, who looks just as Alpine as does Fig. 1.

FIG. 3 (1 view, photo Martin Luther). Another unmixed coastal Lapp from Norway, who shows more of an incipiently mongoloid character than do the two preceding. Like the others, this individual is brunet white in skin color, dark-haired and dark-eyed.

FIG. 4 (1 view, photo Martin Luther). The incipiently mongoloid features found in some Lapps are usually more pronounced in the women than in the men. This Norwegian Lapp woman, who possesses these features, is seen to resemble facially the type commonly known as "Slavic" or "East Baltic," in central and eastern Europe. There is nothing really mongoloid about these features; the resemblance is remote and collateral.

FIG. 5. (1 view, photo Martin Luther). This 18 year old Norwegian Lapp boy possesses all of the most characteristically Lappish features of the face: a shallow mandible; a pointed, retreating chin; a lateral malar prominence; facial prognathism; a pointed and elevated nasal tip; and a low nasal bridge.

FIG. 6 (2 views, photo Martin Luther). A Norwegian Lapp, with light skin, light eyes, and brown hair. Although considered a pure Lapp, this man has many Nordic traits. He is much more typical of the Lapps as a whole than are Figs. 1, 2, or 3, who were chosen to represent the Lappish prototype rather than the Lapps as a group.

FIG. 7 (3 views, Anthropological Laboratory, Institute of Peoples of the North, Leningrad). A 20 year old Samoyed, from northern Russia. This young Samoyed, while by no means exaggeratedly mongoloid, is much more so than any unmixed Lapp; his coarse, black, and straight hair, his dark skin, and black iris color, as well as his facial features, show that he is at least partially descended from fully evolved mongoloid ancestors. Samoyeds vary greatly in mongoloid content; this individual seems to approach the mean in this respect. The arrival of the Samoyeds in northern Europe was later than that of the Lapps; their point of departure in Asia farther east.

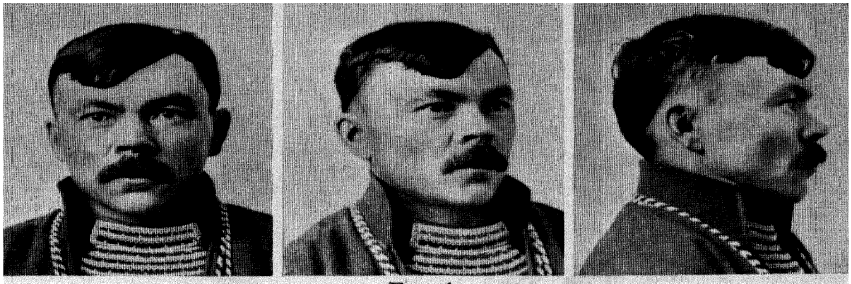


FIG. 1

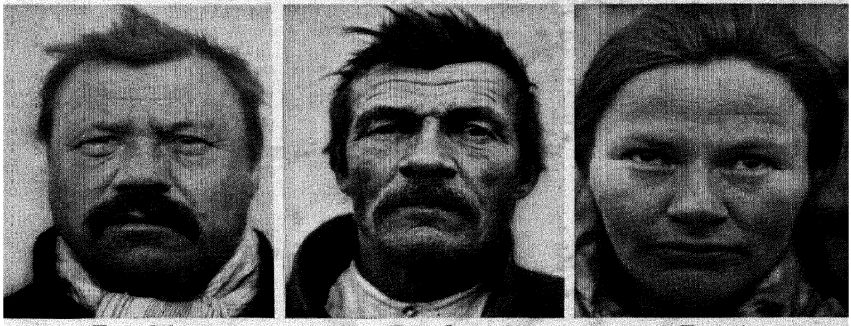


FIG. 2 FIG. 3 FIG. 4

FIG. 5 FIG. 6

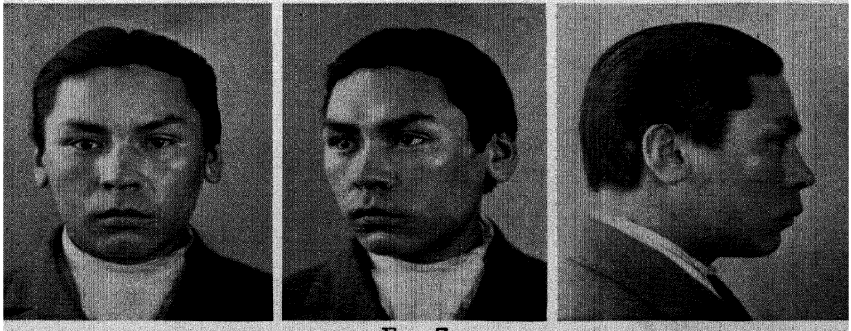


FIG. 7

Plate 2

UGRIAN-SPEAKERS OF LADOGAN-RACIAL TYPE

The Uralic linguistic stock, spoken by Lapps, Finns, Magyars, Asiatic Ugrians, and Samoyeds, is divided into Finno-Ugrian and Samoyedic. The Ugrian branch is today spoken by two widely separated groups, the Magyars of Hungary and Transylvania, and the Ostiaks and Voguls of the Obi drainage. The early Ugrians were presumably, like the Finns, Danubian-like or Nordic peoples of the middle Volga country, who absorbed the older hunting population of the eastern European forest. Later the Ugrians were subjected to mongoloid influences at the times of Hunnish, Turkish, and Mongol invasions. The individuals shown on Plate 2 were chosen to illustrate in varying forms and degrees the old Ladogan racial type.

FIG. 1 (3 views). A Magyar from Budapest; a man of moderately tall stature, hyperbrachycephaly, and moderately great head size; with a large face, low orbits, a wide interorbital distance, and a median eyefold. These characters, in combination with laterally prominent malars and a wide, heavy mandible, mark this individual as a Ladogan prototype. He represents a reëmergence of a racial element living in the eastern European woodlands in early post-glacial times; this type is one of the general group of Palaeolithic survivors, in this case largely unreduced. As with the related Palaeolithic survivors of northwestern Europe, its tendency to blondism must be considered integral, and not the result of Nordic admixture. Like the Lapp this type is incipiently mongoloid, but it differs profoundly from the Lapp in pigmentation, general size, and in the size and structure of the mandible. This individual appears to recapitulate in many respects the original Ladogan strain found among the Ugrian-speaking ancestors of the Magyars who invaded Hungary from their home in the Volga country. While typical of a true Magyar element in his country, he is not typical of the population of Hungary as a whole.

FIG. 2 (3 views, Institute of Peoples of the North). An Ostiak woman from Siberia. The Ladogan facial features are usually better exemplified in women than in men. The Ostiak woman shown above is as good a Ladogan prototype as the Magyar shown above. Note the blond hair, light eyes, the great interorbital distance, the broad, low-bridged nose with elevated snub tip, and the wide malars.

FIG. 3 (3 views, Institute of Peoples of the North). An Ostiak man with some Samoyed admixture; the hair is brown, the eyes mixed, the face freckled. In addition to the Ladogan element seen in the first two, this individual probably contains some evolved mongoloid admixture.

FIG. 4 (3 views, Institute of Peoples of the North). A Vogul man; showing more evidence of mongoloid admixture than the above. It must be emphasized that nearly all of the mongoloid racial factors possessed by the Ugrian speakers resident in Siberia were acquired after their shift of territory from European Russia to Asia.

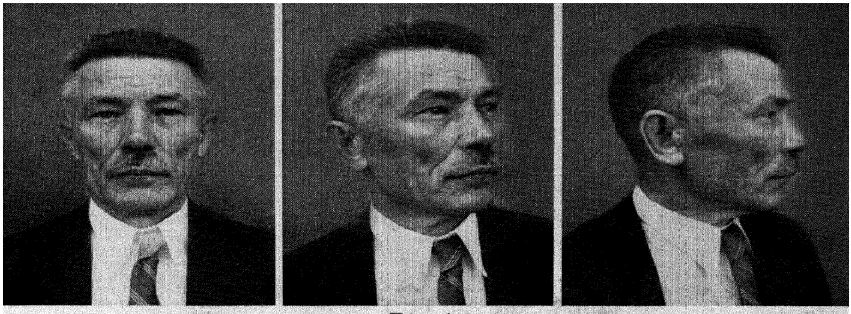


FIG. 1

FIG. 2

FIG. 3

Plate 3

MONGOLOID INFLUENCES IN EASTERN EUROPE AND IN TURKESTAN

The invasions of mongoloid peoples from central Asia during the millennium from about 400 to 1400 A.D. caused the settlement of some Mongols proper (Kalmucks) near the mouth of the Volga, and the partial Mongolizing of some Finnic tribes, especially those which adopted Turkish speech. In Russian Turkestan erstwhile white populations became Mongolized in varying degrees.

FIG. 1 (2 views, photo B. N. Vishnevsky). This deeply brunet Chuvash, a member of a tribe of Turkicized Finns in what is now the Chuvash Republic of eastern Russia, represents, in his facial features, either a pronounced early Ladogan prototype, or Mongol admixture, or both.

FIG. 2 (1 view, photo B. N. Vishnevsky). A lighter-skinned, less mongoloid Chuvash. The median eyefold and snubbed nasal tip, with laterally oriented nostril axes, are Ladogan rather than mongoloid.

FIG. 3 (3 views, photo J. Wastl, *Archiv für Rassenbilder*, Bildaufsatz 2, Archivkarte 11, 1926. Herausgeber E. von Eickstedt, J. F. Lehmans Verlag, München). A Bashkir, member of another tribe of Turkicized Finns living in the Kazan district and the southern Urals. This individual is almost completely mongoloid in the central Asiatic sense.

FIG. 4 (2 views, photo Gordon T. Bowles). An Uzbeg from Russian Turkestan. The Uzbegs are Turkish-speaking inhabitants of the central Asiatic khanates, of mixed origin. This individual shows a partially mongoloid condition usual among these people.

FIG. 5 (1 view, photo B. N. Vishnevsky). A Tajik from Russian Turkestan; the Tajiks are Iranian-speaking farmers inhabiting the oases of some of the khanates, and the Pamir mountains to the south. While characteristically European in race, a few of the Tajiks show evidences of mongoloid admixture.

FIG. 6 (3 views, photo B. N. Vishnevsky). An Arabic-speaking native of Russian Turkestan. The remnants of the Arab invasions of the Middle Ages have been mostly absorbed by the Uzbegs, and those who retain their Semitic idiom have been in most cases racially altered. The old man shown here represents a common type in Turkestan regardless of speech or ethnic affiliation; a mixture between a mongoloid and a long-faced local Mediterranean strain, giving a pseudo-Armenoid appearance. Note the long, straight, coarse beard, a common feature among individuals of this type, which von Eickstedt calls *Turanid*.

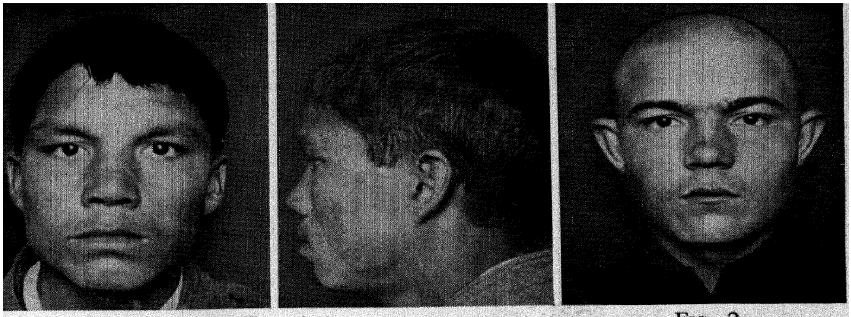


FIG. 1 FIG. 2

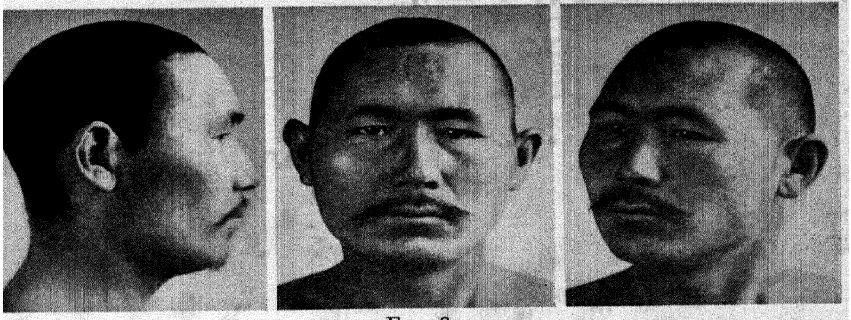


FIG. 3

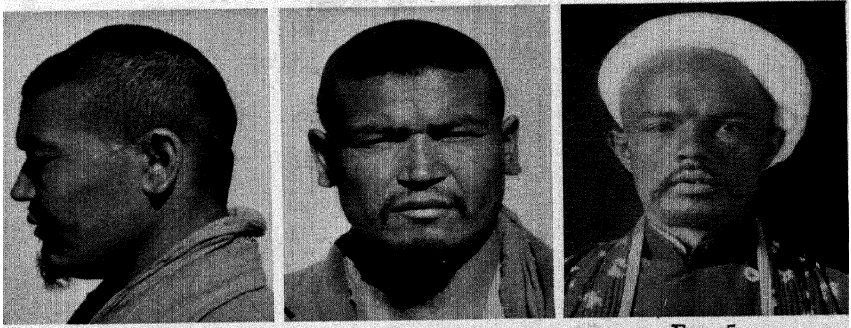


FIG. 4 FIG. 5

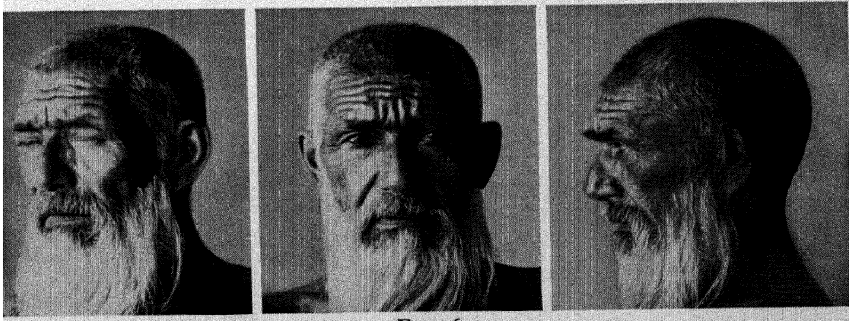


FIG. 6

Plate 4

BRÜNN SURVIVORS IN SCANDINAVIA

All Upper Palaeolithic survivors may be divided into two general groups (a) those who have been subjected to reduction in head size and bodily bulk, and who have been partially foetalized in the course of the same process; and (b) those who retain the head size, bodily bulk, and masculinity of features characteristic of the Pleistocene hunters. Most of the latter group are to be found in northwestern Europe. Dolichocephalic individuals who recapitulate the metrical and morphological qualities of the Crô-Magnon and Brünn-Předmost Aurignacian people are commonest in Scandinavia and in Ireland. In Scandinavia they are found concentrated along the southern Swedish coast in the neighborhood of Göteborg, and in the mountains of southwestern Norway.

FIG. 1 (3 views). A Swede from Trollhatton, southern Sweden. This man is both tall and heavy; of lateral bodily build. His head is of prodigious length, his face nearly as wide as his cranial vault; all dimensions of the face are great, especially the width of the mandible; the distance between the eyes, and the heaviness of the browridges, are likewise remarkable. This individual recapitulates, as closely probably as any other living human being, the physical type of many of the hunters who lived in western and central Europe during the Laufen Interglacial and the last advance of the ice. Note that in his case, as with most of his type, only a partial degree of blondism is present.

FIG. 2 (3 views). Another Swede, in this case from Göteborg, a slightly less extreme example of the same type. Swedes of this type are habitually found in association with the sea. Both of these individuals, as well as Fig. 4, were measured and photographed in a Boston shipyard.

FIG. 3 (3 views, from Alette Schreiner, *Anthropologische Lokaluntersuchungen in Norge; Valle, Halandsdal, und Eidfjord.* Oslo, 1930. #113). This Norwegian from the isolated mountain settlement of Valle in southwestern Norway represents the same basic type as the two men above; his face and mandible, however, are narrower, and his hair ash blond; admixture with Nordics is indicated.

FIG. 4 (3 views). The same conclusion is suggested in reference to this extremely long-faced and golden-haired Swede from Helsingborg. He is, however, much larger in head and face size, much heavier in body build, and heavier in the facial skeleton than any Nordic. The predominant strain is Upper Palaeolithic.

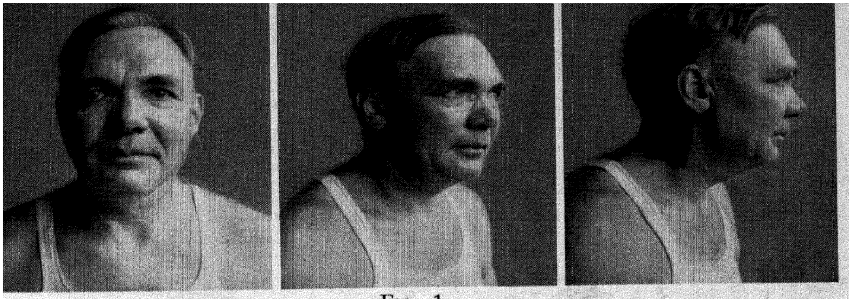


FIG. 1

FIG. 2

FIG. 3

FIG. 4

Plate 5

BORREBY SURVIVORS IN THE NORTH

In the same districts of southern Sweden where Brünn survivors are found, and across the Skaggerrak in Jutland, are found brachycephalic Upper Palaeolithic survivors, equally unreduced in head and body size, equally if not more lateral in bodily build. The ancestors of these people arrived on the western Baltic shores during the Late Mesolithic. Other colonies of them are to be found in the coastal districts of southwestern Norway, and they form an element of primary importance in the population of Germany. In general, their present distribution is wider than that of their dolichocephalic counterparts.

FIG. 1 (3 views). A Dane from Jutland, very tall, heavy, lateral in build, with an enormous head and an extremely wide face. This individual is as exaggerated an example of the Borreby race as is #1 of the preceding plate of the Brünn race.

FIG. 2 (3 views). A Swede from Göteborg, representing more nearly the mean of the Borreby race as it is found today. Both this man and #1 are golden blond in hair color; the Borreby group seems to run lighter-haired than the Brünn.

FIG. 3 (2 views, Bryn and Schreiner, *Die Somatologie der Norweger*, Table 44, Fig. 121). This individual, while less brachycephalic than many of his compatriots, especially those in the Jaeren district, shows an essential affiliation to the Borreby race. The apparent facial flatness and the formation of the region of the nasal tip and the upper lip look "Irish"; this is an Upper Palaeolithic facial condition common both to Scandinavians and to British of Upper Palaeolithic type.

FIG. 4 (1 view, Gudmundur Kamban, author of *I See a Wondrous Land*, G. P. Putnam & Sons, N. Y.). A prominent Icelandic author, who presents the same facial features and belongs to the general Borreby racial type. Iceland was settled mainly from the coastal regions of Norway in which the Borreby race is prevalent; an important Irish increment may have added a similar racial element.

FIG. 5 (3 views). A Finnish example of the Borreby race. This Finn is more brachycephalic than most Borreby men; however his lateral bodily build, and his extreme breadth of face and mandible show that he is a trans-Baltic member.

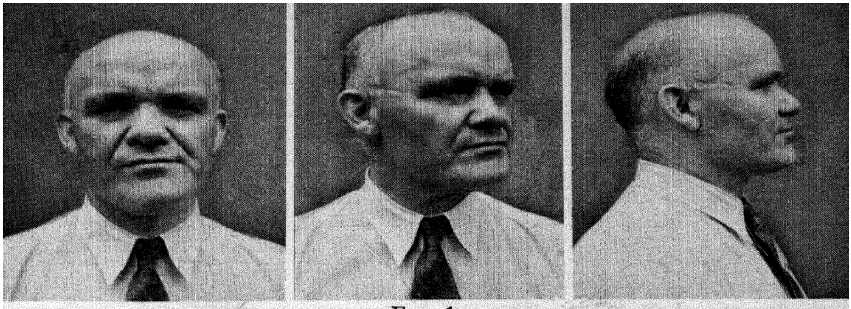


FIG. 1

FIG. 2

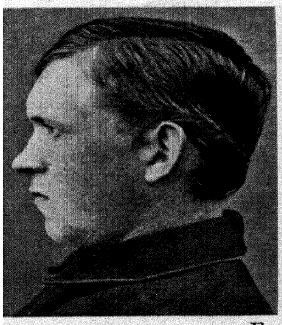


FIG. 3

FIG. 4

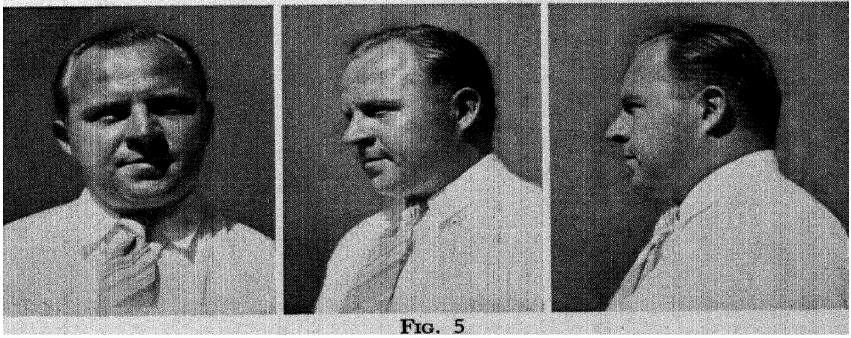


FIG. 5

Plate 6

BORREBY MEN IN GERMANY AND ELSEWHERE

The Borreby race was a relatively late Mesolithic arrival in Scandinavia; its earlier seat was central Germany, with ramifications both to the east and the west. Today it is probably the one most important racial element in much of northern and central Germany, with wide ramifications elsewhere. Its German form is, however, seldom as exaggerated as that in the north. In this sense it is partly transitional to the Alpine race on the one hand, and to the Ladogan on the other.

FIG. 1 (2 views, Saller, K., "Die Fehmaraner," *Deutsche Rassenkunde*, vol. 4, 1930, Tafel XI, #H-11, #2193). A concentration of a specialized and exaggerated Borreby type or types is found on the island of Fehmaran, between the Danish Archipelago and Germany. The individual shown has especially heavy browridges and a great nasion depression. Others are often rounder-faced and usually show less exaggerated facial profiles. The browridges on this individual recall Upper Palaeolithic prototypes.

FIG. 2 (1 view, C. W. Dupertuis, Century of Progress). A German Borreby type with the excessive head breadth of 175 mm., which must be one of the widest non-deformed head breadths ever measured. This width is greater than the lengths of some heads shown in this section.

FIG. 3 (3 views). A characteristic West-German Borreby type, from Stuttgart. The southwest-German Borreby nucleus has mixed with all invaders from the initial Neolithic onwards. It was with Borreby people from this region that the Bell-Beaker Folk mixed, before their invasion of Britain in the Early Bronze Age.

FIG. 4 (3 views). A metrically typical Borreby specimen, a White Russian from the region of Vilna. The presence of this type to the southeast of the Baltic establishes its continuity between Germany and Finland.

FIG. 5 (3 views). A North Italian from Lombardy, who, although brunet in hair color, conforms metrically and morphologically to the Borreby standard. He comes from typically Alpine and Dinaric territory.

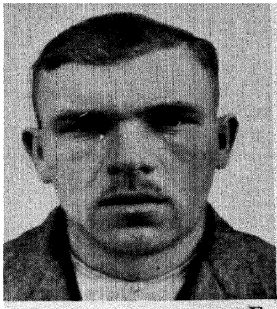


FIG. 1

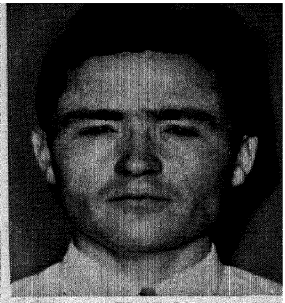


FIG. 2

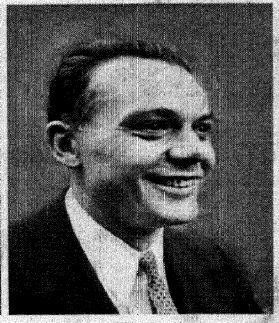


FIG. 3

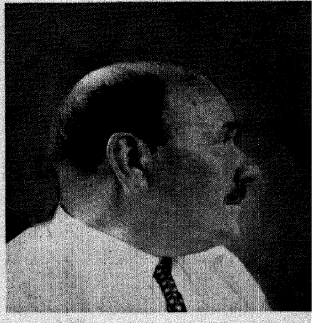
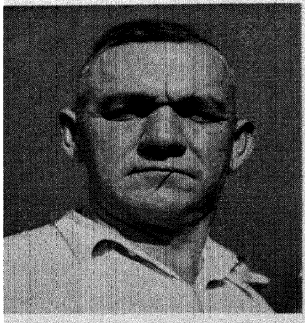
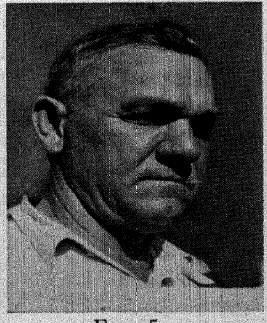


FIG. 4





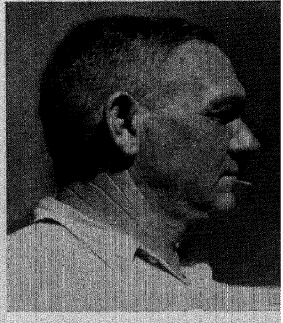


FIG. 5

Plate 7

EAST BALTICS

The term East Baltic is properly applicable to a racial type of composite nature, found chiefly in northeastern Germany, Poland, the Baltic States, and Finland, although it also occurs sporadically in Sweden and elsewhere. It is a partially reduced Borreby derivative, with Ladogan and Nordic admixture.

FIG. 1 (2 views, Wide World photos). Field Marshal von Hindenburg, a native of East Prussia, and a classic example of the East Baltic racial type, to which many Prussians of the land-owning Junker class belong.

FIG. 2 (1 view, Pix Publications, Inc.). Field Marshal Werner von Blomberg, a successor of von Hindenburg, derived from the same ethnic source and a member of the same racial category.

FIG. 3 (3 views). A Pole from Grodno. This individual approaches Borreby dimensions in the cranial vault.

FIG. 4 (3 views). A Lithuanian from the region of Vilna, who shows the Ladogan affiliation of this type clearly.

FIG. 5 (3 views). A Finn from Tampere, Tavastehus. This man seems to show more evidence of Nordic influence than the others. As these pictures show, the East Baltic is not a stable or a basic racial type, but a variable blend.

FIG. 1

FIG. 2

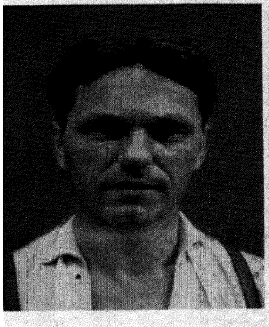


FIG. 3

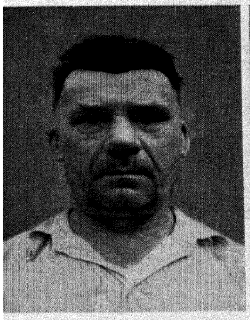


FIG. 4

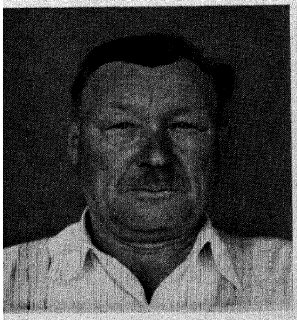


FIG. 5

Plate 8

CARPATHIAN AND BALKAN BORREBY-LIKE TYPES

Evidence of the survival of an extremely tall, brachycephalized, Upper Palaeolithic stock is found to a lesser extent in the Carpathians; and to a greater, in the nucleus of the Dinaric Alpine region, from Bosnia to northern Albania, and centered in Montenegro. Although the presence of these nuclei cannot now be fully explained, it seems probable that they represent local survivals and reëmergences of relatively unreduced Upper Palaeolithic populations. The Montenegrins are the tallest people in Europe; their tallness does not, however, imply a thin or linear build; their bodies are frequently thick-set, lateral in constitutional type.

FIG. 1 (3 views). A Carpatho-Russian, or Ruthenian, from the Polish Carpathians. His tall stature, heavy bony structure, large face, etc., point to a basic relationship with the unreduced Upper Palaeolithic survivors of the northwest.

FIG. 2 (3 views). A Montenegrin of aristocratic lineage; in the main an oversized, Upper Palaeolithic survivor, but brunet in pigmentation, like many of the Serbs to whom the Montenegrins are closely related, and who do not, as a rule, possess the oversized characters of their mountain kinsmen.

FIG. 3 (2 views, R. W. Ehrich photo). A blond Montenegrin with extreme width of the cranial vault and mandible.

FIG. 4 (1 view). An Albanian from Malsia ë Madhë, near the Montenegrin border.

FIG. 5 (2 views). An Albanian from the clan of Shoshi in the isolated mountain tribe of Dukagin. This man is a blond giant with a broad, heavy-boned body; his face is shorter than the width of his mandible. The unreduced Upper Palaeolithic character of the local mountain type is clearly seen in this individual.

FIG. 6 (1 view). A tall, portly man from Malsia ë Madhë; his facial features show an approach to those of the smaller, less rugged form of the Alpine race, which is particularly strong in southern Albania.

FIG. 1

FIG. 2

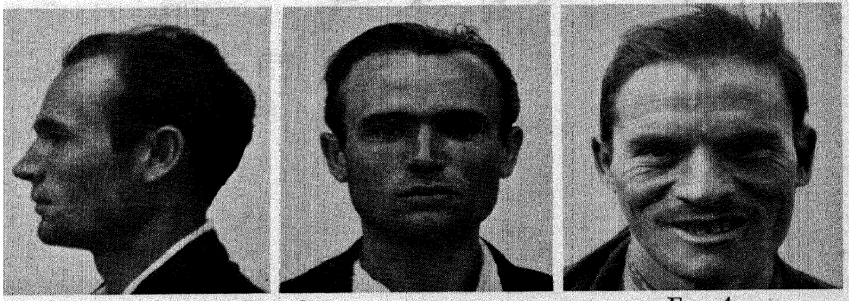


FIG. 3

FIG. 4

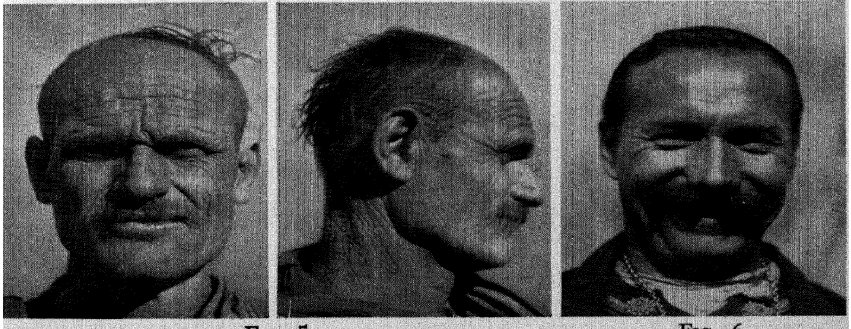


FIG. 5

FIG. 6

Plate 9

UPPER PALAEOLITHIC SURVIVALS IN IRELAND

Ireland was first settled in the post-glacial Mesolithic by people of Upper Palaeolithic type coming overland from Scotland. The Mesolithic cultural period was long and full in Ireland, and the subsequent invaders of this westernmost fringe of Europe have been unable to effect a genetic displacement of the strain introduced by the earliest human occupants. This strain has undergone an evolution of its own in Ireland, as the presence side by side of individuals showing various stages and types of change will make clear.

FIG. 1 (3 views). County Cork. A man of medium stature but great body size, massive bony structure and heavy musculature; a large head, heavy brows, deep, wide mandible and projecting chin. This individual is a close Irish approximation to the Brünn race of Scandinavia. His golden hair is curly; curly hair is a local specialty of the Irish Upper Palaeolithic group. It is also, however, occasionally found among Lapps and Finns.

FIG. 2 (2 views, photo C. W. Dupertuis). County Clare. Cork, Kerry, and Clare are the three Irish counties in which unreduced Palaeolithic survivors form the major element in the population. This large individual has a head of full Brünn-Borreby size dimensions, but one that is intermediate between the two Scandinavian types in form. This is typical of the Irish Palaeolithic group, which is characteristically mesocephalic or sub-brachycephalic and forms a single unit in this respect. The individual depicted possesses a mandible of extreme width, comparable to the widest in Scandinavia. Note that the hair is red and the complexion florid; rufosity is closely linked to Upper Palaeolithic survival in Ireland

FIG. 3 (1 view, photo C. W. Dupertuis). Another Clare man of similar type but less extreme dimensions. This type of Irishman is very common in America.

FIG. 4 (2 views, photo C. W. Dupertuis). An Irishman from Leitrim, whose facial features are typically Irish, and yet who approximates a Nordic form in most anthropometric dimensions. There may well have been Nordic mixture involved in the production of this type, taking the form of a simple reduction in lateral size dimensions. In any case the facial features are of pure Upper Palaeolithic inspiration.

FIG. 5 (1 view). A Finn from Vasa (S. Ostrobothnia), who is anthropometrically and morphologically very close to the Irishman from Leitrim. The same curly hair, and the same conformation of the forehead, lips, and nose have produced a striking similarity. This and other evidence indicate that features which in Finns are often popularly supposed to be mongoloid are actually of European Upper Palaeolithic inspiration.

FIG. 6 (2 views, photo C. W. Dupertuis). A small-headed, absolutely short-headed, and snub-nosed youth from County Longford. This individual serves as an excellent example of the extreme in size reduction and in partial foetalization which has taken place in some Irish Upper Palaeolithic survivors, comparable and parallel to the development of the Alpine race on the Continent.

FIG. 7 (1 view). County Cork. An example of notable facial and alveolar prognathism in the case of a dark-haired, light-eyed Irishman. This feature is commoner with Irish of a tall Mediterranean type than with the Upper Palaeolithic strain proper.

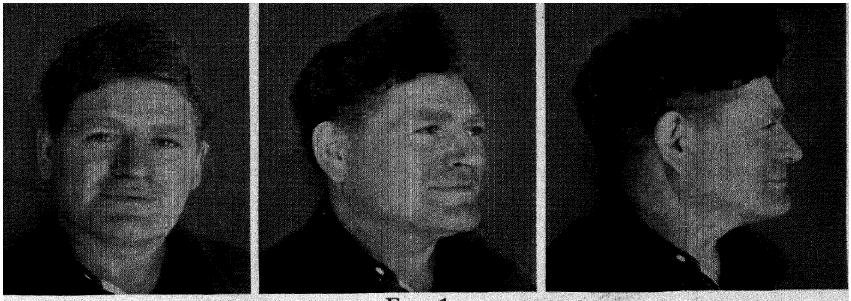


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

Plate 10

UPPER PALAEOLITHIC SURVIVALS IN MOROCCO

During the Late Pleistocene North Africa was inhabited by the Afalou men, a race of tall, large-headed, heavy-boned, people with exaggeratedly rugged cranial and facial features comparable to those of the Crô-Magnon—Brünn group in Europe. This Afalou race bore with it a tendency to brachycephaly. In post-glacial time North Africa has been a highroad of invasion, from the eastern Mediterranean to Europe, and the survivors of those Afalou people who remained are to be found mostly in two refuge areas, the Moroccan Rif and the Canary Islands. Here only the Riffian group will be depicted. In the Rif, besides more numerous Mediterraneans, Nordics, and mixed types, the Afalou strain has survived or reëmerged in recognizable form, and may be seen to have gone through an evolution parallel to that of European Upper Palaeolithic survivors in Ireland and on the continent of Europe. As in Europe, these survivors are often blond; as in Ireland, frequently rufous.

FIG. 1 (2 views). A sheikh of Targuist. Blond, metrically comparable to the Nordics, as in the case of the Irishman in FIG. 4 of the preceding plate, but in the same sense un-Nordic in facial features; probably Nordic mixture is partly responsible.

FIG. 2 (2 views). A larger-headed, mesocephalic example of the same type, comparable in features to Northwest Europeans with Borreby blood; like the first example and wholly unlike the Nordic and Mediterranean strains in the Rif, this individual is lateral in constitutional type; heavy boned, and heavily muscled. This man is a *fkih* (schoolmaster and leader of the mosque) in the Riffian tribe of Beni Ulishk.

FIG. 3 (2 views). The *kaid* or governor of the tribe of Targuist. For some unknown reason Riffians who hold public office usually belong to this physical type. The *kaid* is rufous, and like many Riffians, could pass for an Irishman if differently clothed and coiffured.

FIG. 4 (2 views). A very blond youth from the Senhajan tribe of Ktama, the most isolated spot in northern Morocco. Facially he resembles a southern Swede; closely similar individuals have been observed in the Canary Islands. The dimensions of his head are small, however; he must be regarded as a mesocephalic, cranially reduced type similar to the Irishman on plate 9, Fig. 6.

FIG. 5 (2 views). A highland Beni Urriaghel Riffian; short-statured, laterally built, rufous; with a snub nose and short face; a reduced mesocephalic Afalou type.

FIG. 6 (1 view). A kaid of Taghzuth, a small tribe of Senhajan craftsmen located in the high mountain forest immediately west of the Rif. Rufous and exaggeratedly "Irish" in facial features.

FIG. 7 (1 view). An old Riffian warrior, one of the Ulad Abd el Mumen clan in the Vale of Iherrushen, Gzennaya. Although indistinguishable metrically from many tall Mediterraneans, this individual possesses morphological features in the region of the eyes, nose, mouth, and jaw, which are clearly of Afalou inspiration, and which give him an "Irish" look.

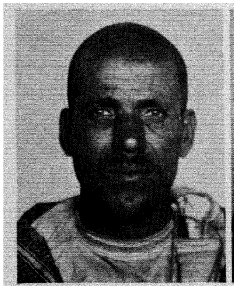
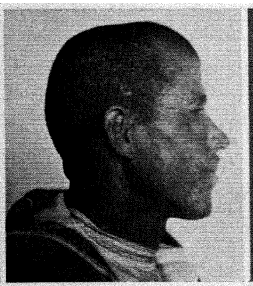


FIG. 1



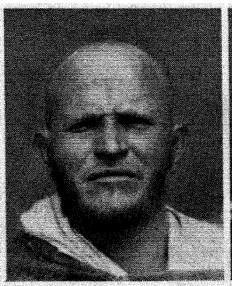
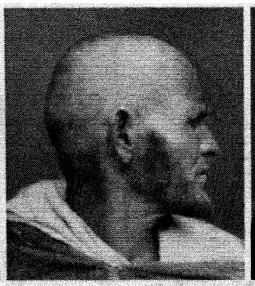


FIG. 2



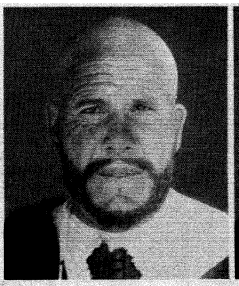
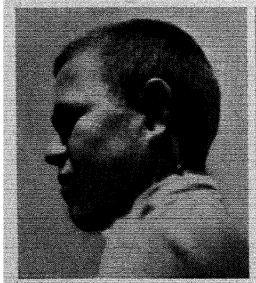


FIG. 3



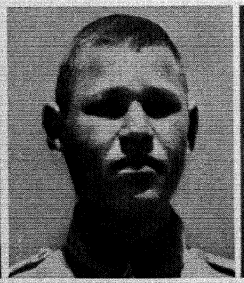
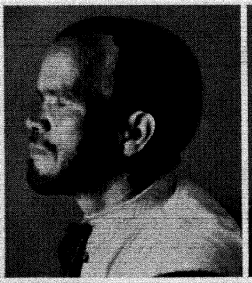


FIG. 4



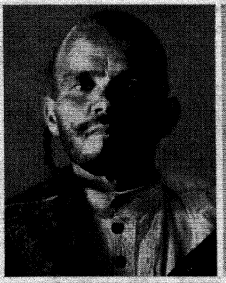


FIG. 5

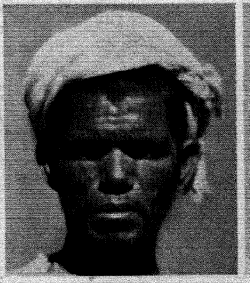


FIG. 6

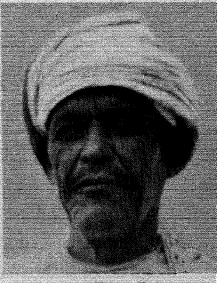


FIG. 7

Plate 11

THE ALPINE RACE IN GERMANY

The Alpine race is a reduced Upper Palaeolithic survivor; Alpines are as a rule of but medium stature, and lateral in bodily build; their heads of moderate size and globular; their faces characteristically round and their facial features slightly infantile. Their pigmentation ranges from blond to brunet, but is usually intermediate. The Alpines represent a reëmergence of a brachycephalized and partially foetalized Palaeolithic survival in the central highland and forest zone of Europe and Asia, all the way from the Pyrenees to the Pamirs. Alpines are at the root of all or nearly all the brachycephalic racial types throughout this entire expanse of territory. The Alpine territorial distribution is not the result of an invasion or expansion, but of a parallel set of emergences. In Europe, southern Germany is the seat of one of the greatest Alpine concentrations in the continent. The best place in the world to find Alpines is in a Bavarian restaurant; that is where all four individuals on this plate were photographed and measured.

FIG. 1 (3 views). A metrically and morphologically perfect Alpine, from Brandenburg.

FIG. 2 (3 views). A tall, curly-haired, and portly Alpine from the Hirschenberg, near Miesbach, Upper Bavaria; this individual might be considered the quintessence of a Bavarian.

FIG. 3 (3 views). An Alpine from the Black Forest, Baden.

FIG. 4 (3 views). An Alpine from the Spreewald, of German, not Wendish, origin. The low brachycephalic index, and the relative fineness of the facial features indicate a tendency in a Nordic direction.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

Plate 12

THE ALPINE RACE IN WESTERN AND CENTRAL EUROPE

FIG. 1 (3 views). A Basque from Vizcaya, Spain. This blond Basque was rufous and freckled in childhood; his curly hair and facial features give him an Irish appearance. Nevertheless his general racial classification is with the Alpine group. This is an uncommon type for a Basque, since most of them are Atlanto-Mediterraneans and Dinarics.

FIG. 2 (3 views). A perfect example of a French Alpine. This individual is a Parisian, but his mother came from the Pyrenees.

FIG. 3 (3 views). A Ladin-speaking Swiss from the Canton of Ticino (Tessin). A fully brunet Alpine, typical of southeastern Switzerland and northern Italy.

FIG. 4 (3 views). A Czech from Bohemia, Alpine morphologically but not as brachycephalic as the Alpine mean.

FIG. 1

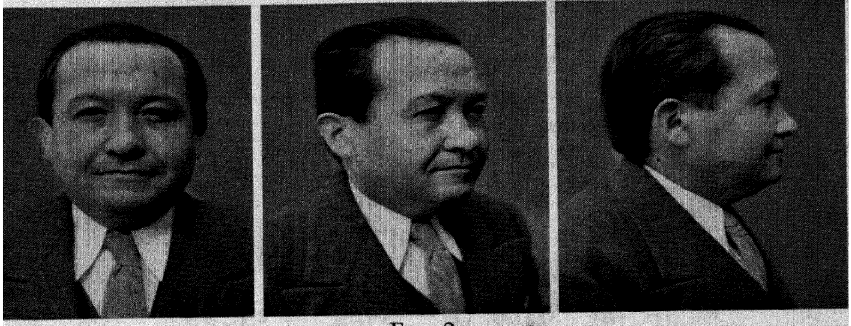


FIG. 2

FIG. 3

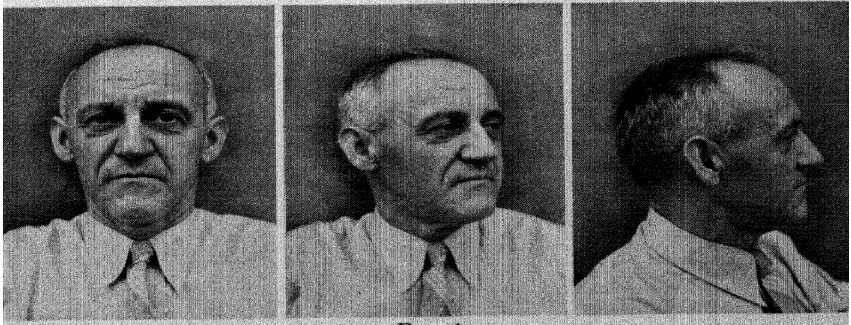


FIG. 4

Plate 13

ABERRANT ALPINE FORMS IN WESTERN AND CENTRAL EUROPE

FIG. 1 (3 views). A Scotsman from Aberdeen, with blue eyes and dark brown hair. This brachycephalic Aberdonian is Alpine in head form and in most facial features; the length of the face and of the nose, however, are aberrant and point to non-Alpine influences. The predominant Alpine element present in this individual is presumably that which entered Scotland from the Continent during the Bronze Age with the Short Cist People. Other brachycephalic Scotsmen sometimes show Borreby features.

FIG. 2 (3 views). A Frenchman from the Limousin region; father from the Dordogne, mother from Limoges. The sloping forehead and prominent nasal profile of this individual, as well as his long face and wide jaw, indicate non-Alpine influences; he presumably carries a strain of the large-headed early Mediterranean or Upper Palaeolithic element prevalent in this part of France and first noticed by Ripley.

FIG. 3 (3 views). A Frenchman from Doubs, in Burgundy. This large-headed and relatively tall northeastern Frenchman represents the local brachycephalic type differentiated from the southcentral French Alpines largely by stature and pigmentation.

FIG. 4 (3 views). A Walloon, born in France, whose parents were from Ghent. Large-headed, not excessively brachycephalic, this individual is typical of the Walloon-speaking population of the hilly southeastern half of Belgium.

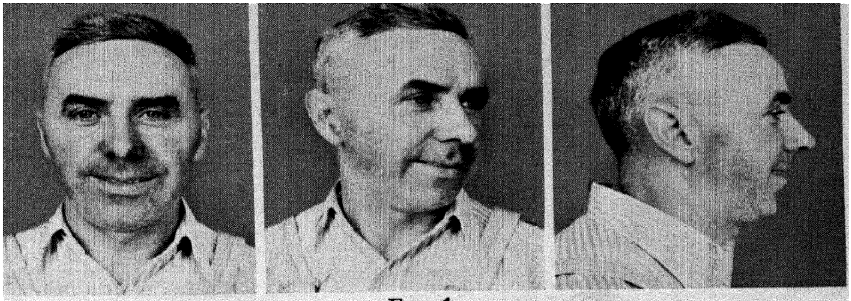


FIG. 1

FIG. 2

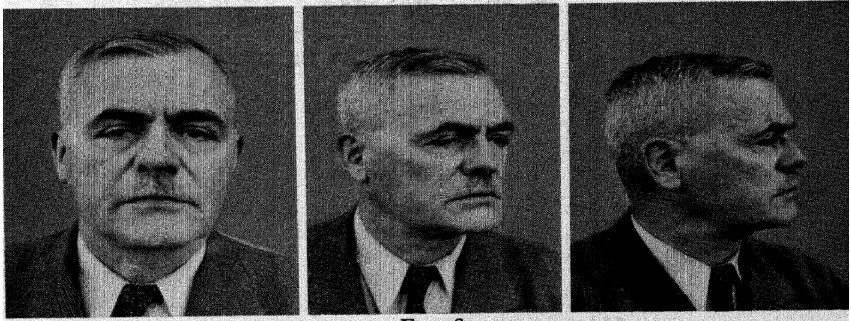


FIG. 3

FIG. 4

Plate 14

ALPINES FROM CENTRAL, EASTERN, AND SOUTHEASTERN EUROPE

East of Bavaria, Bohemia, and Switzerland, typical Alpines are relatively rare until one reaches southern Albania and Greece; their northeastern limit of frequency is the Carpathians, and between the Carpathians and the Adriatic, they are usually found in a hybridized (Dinaricized) form.

FIG. 1 (3 views). Magyar from Pecas, Hungary. This tall Alpine from Hungary is, except for his stature, as perfect an example of the Alpine race as could be found; he may be compared to the Alpines on Plate 11, from Germany. Hungary is ethnically a composite nation, and this individual's family has traditions of both French and German admixture.

FIG. 2 (3 views). Ukrainian from Novograd Volynsk, in the Volhyn District. Like many Volhynians, this individual is predominantly Alpine, although he shows evidence of Atlanto-Mediterranean or Nordic admixture, or both. The Volhyn constitutes in part an Alpine sub-nucleus to the northeast of the Carpathians.

FIG. 3 (2 views, photo Marion Lambert). A Tosc from Katundi, southern Albania. This man is as perfect an Alpine as the Hungarian on the preceding plate, the Frenchman on Plate 12, Fig. 2, or the Germans on Plate 11. Southern Albania forms an Alpine nucleus comparable to that in southcentral France or Bavaria.

FIG. 4 (1 view). Another Alpine Tosc; in this case from Gjinokaster, in the extreme southwest of Albania, bordering on Epirus.

FIG. 5 (3 views). A Greek from Sparta. The Alpine strain of southern Albania extends down through western Greece into the Peloponnesus. In Greece it is frequently blended with a local tall Mediterranean strain.

FIG. 1

FIG. 2

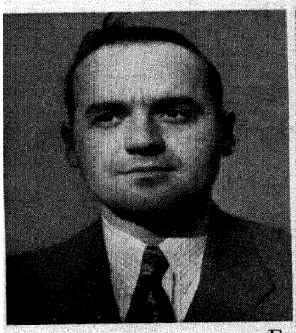


FIG. 3

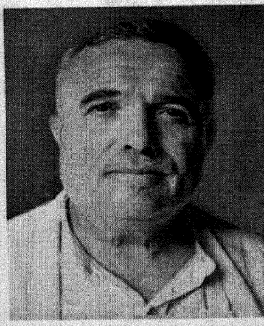


FIG. 4

FIG. 5

Plate 15

ASIATIC ALPINES

The Alpine race is as important in the mountain zone from Syria to the Pamirs as it is in the corresponding portion of Europe. Both anthropometrically and morphologically, the European and Asiatic Alpines are essentially identical. Furthermore, when not too strongly altered by mixture with other stocks, the Asiatic Alpines tend to an intermediate pigment condition comparable to that of their European counterparts.

FIG. 1 (3 views). A Syrian Alpine from Damascus. This man is typically Alpine, except perhaps for his rather extreme face length.

FIG. 2 (3 views). A Druze from Shuf, southern Syria. This man is in all respects an excellent Alpine. The Druze, followers of a secret religion based on the schismatic teachings of the Khalifa Hakim of the Mediaeval Fatimid Dynasty, claim to be descended from immigrants who moved from Yemen to Syria in the sixth century A.D. Although this tradition may be accurate, nevertheless the majority of the Druzes today are brachycephalic, and show a predominance of Alpine racial characters, which could only have had a local origin.

FIG. 3 (3 views). An Armenian from Cilicia, Asia Minor. The Armenians, for the most part Dinaricized, include in their ranks a minority of individuals who represent, as does this man, the Alpine prototype of the Asia Minor brachycephals.

FIG. 4 (1 view, photo B. N. Vishnevsky). An Iranian speaker from Russian Turkestan; a good example of a central Asiatic Alpine.

FIG. 5 (1 view, photo B. N. Vishnevsky). A Mountain Tajik from the Pamirs. The Tajiks are basically Alpine, and resemble the south-central French closely in an anthropometric sense. They form the last major outpost of the Alpine race to the East, as far as we know at present.

FIG. 6 (1 view, from a tempera painting by the artist Iacovleff, from his album *Peintures d'Asie*, Paris, 1935, permission Mme. Iacovleff). An Alpine-looking Hunza from the Hunza valley above Gilgit, in the Himalayas. The western Himalayas, from Kafiristan over into Tibet, are proving to be a refuge area of the greatest importance, with interesting racial as well as cultural implications. Nordics, various varieties of Mediterraneans, as well as Alpines and other strains are apparently preserved in the inaccessible valleys of this territory.

FIG. 1

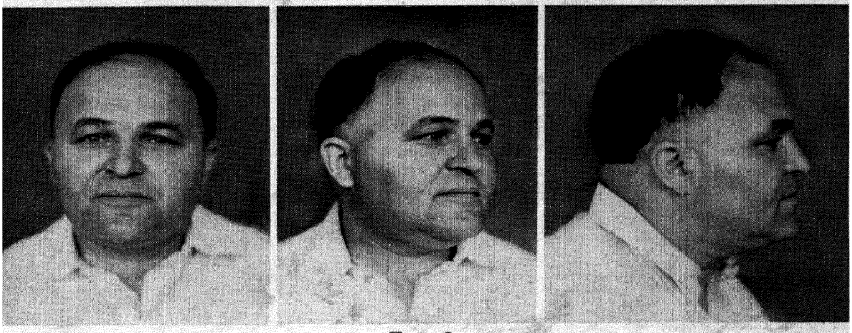


FIG. 2

FIG. 3

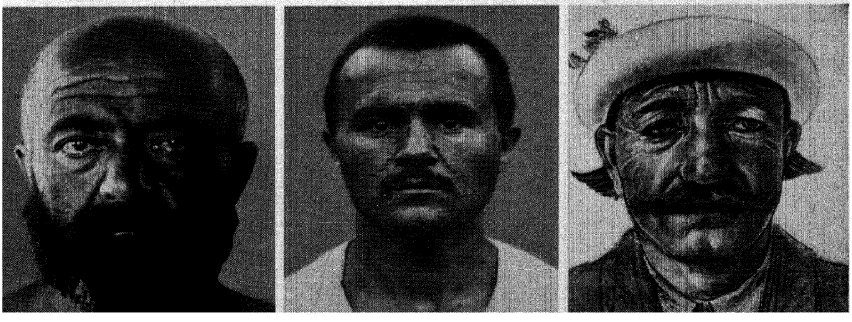


Plate 16

THE MEDITERRANEAN RACE IN ARABIA

The Mediterranean race, in the widest sense, is one of the two basic divisions of the white stock. Although varying greatly in stature, different varieties of Mediterraneans do not, as types, attain the bulk, either in head or body size, of the unreduced Upper Palaeolithic group; tall Mediterraneans, whether or not depigmented (partially depigmented Mediterraneans are Nordics) are usually slender. Small or moderate statured Mediterraneans are as a rule less lateral in build than reduced Upper Palaeolithic survivors.

The homeland of the Mediterranean race appears to lie somewhere between East Africa and the Mediterranean, between the Indian Ocean and the Caspian Sea, and between the Egyptian Delta and India. Arabia is centrally located within this general territory, and the parts of Arabia lying west and north of the Ruba' el Khali desert seem to be basic Mediterranean territory.

FIG. 1 (2 views). A youthful Yemeni from the desert-border tribe of Hadha. Facially he is a perfect example of a refined Mediterranean type; his head length is a little short, his stature a little tall, for the mean. He is a brunet-white in unexposed skin color, brunet in hair and eye color; narrower-faced than any of the Upper Palaeolithic survivors, reduced or unreduced, whom we have seen in the preceding plates. His forehead and jaw are both consistently narrow. It is a characteristic of the Mediterranean race, as of this individual, that the upper face height and nose height are great, no matter how small the other dimensions. Imagine this individual pink-skinned, blue-eyed, and blond-haired, and you will have a close approximation to a Nordic. There is no essential difference between the two races other than pigmentation. Both, however, are separated by a wide racial gap from the Upper Palaeolithic group.

FIG. 2 (2 views). Another Yemeni highlander, in this case from the escarpment tribe of Beni Madhar. This man is shorter in stature, and much longer-headed. He is mixed in eye color; some 25 per cent of all pure brunet Mediterranean groups possess a trace of incipient blondism. The cranial and facial dimensions of this individual resemble those of the larger, Atlanto-Mediterranean strain as found in western Europe and North Africa. In Arabia the two are not clearly differentiated.

FIG. 3 (2 views). A Yemeni soldier from the tribe of Khaulan, which goes back historically to Sabaean times. Metrically a perfect Mediterranean central type, this individual possesses a thin, aquiline nose of a type found frequently but by no means exclusively among Arabs.

FIG. 4 (2 views, photo Henry Field. Courtesy of the Field Museum of Natural History, Chicago). A Ruwalla Bedawin, a member of an aristocratic tribe of camel breeders who inhabit the Syrian desert. The Ruwalla, more brunet than the Yemenis, resemble them closely in most respects.

FIG. 5 (2 views, photo Henry Field. Courtesy of the Field Museum of Natural History, Chicago). A Solubbi; member of a small group of desert wanderers and outcasts who inhabit the North Arabian desert, travelling in small family groups and serving as hunters and tinkers for the Bedawin. They are the purest Mediterraneans in northern Arabia, and probably represent an extremely ancient element in the North Arabian population. This Solubbi may be considered a classical Mediterranean.

FIG. 6 (2 views, photo Henry Field. From Field, Henry, *Arabs of Central Iraq*, Anth. Mem. of the Field Museum of Natural History, vol. 4, 1935, Plate LXXX). A tall Mediterranean from Iraq. The Iraqians, who are apparently direct and unaltered descendants of the ancient Mesopotamians, are Mediterraneans. They are, however, on the whole taller, darker-skinned, longer-faced, and straighter-haired than the Arabs.

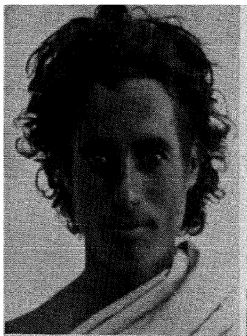


FIG. 1

FIG. 2

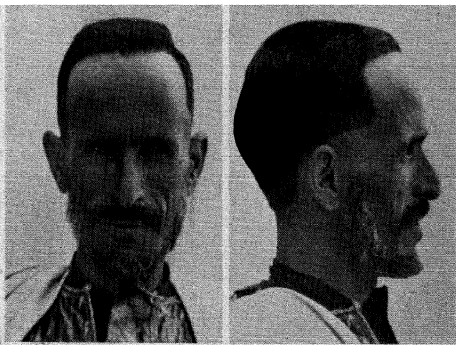


FIG. 3

FIG. 4

FIG. 5

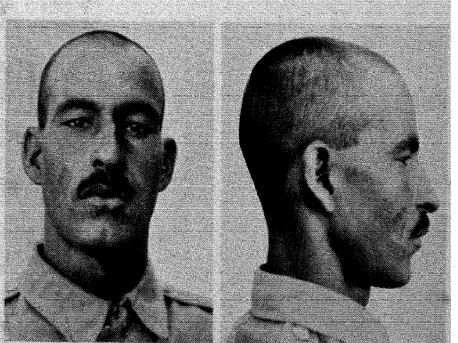


FIG. 6

LONG-FACED MEDITERRANEANS OF THE WESTERN ASIATIC HIGHLANDS

In the highland zone of western Asia, aside from the Alpine reëmergences already studied, the most important racial type is a moderately tall to tall, slender, brunet Mediterranean type characterized especially by a great length of the face and nose. In Syria and Anatolia, as in Armenia and the Caucasus, this type occurs sporadically in the midst of Alpines and, more commonly, of Alpine-Mediterranean hybrids; in Iran and Afghanistan the dolichocephalic strain or strains are numerically predominant.

FIG. 1 (3 views). A Turk from Kharput, eastern Turkey. This moderately tall, brunet Mediterranean Turk is remarkable for his considerable head length, and especially for the great height of his upper face and nose. The original Seljuks and Osmanlis who invaded Asia Minor and founded the Turkish Empire probably were men of this same general physical type. Like the Finns, the Turks never were, in all likelihood, mongoloid.

FIG. 2 (3 views). A Syrian from Kfar 'Akal, who, although slightly brachycephalized by the prevailing head form of Syria, still retains the essential features of the long-faced, long-nosed Mediterranean prototype of this region.

FIG. 3 (3 views). A dolichocephalic Armenian from Kharput. Dolichocephalic Armenians are rare; this individual appears to be a perfect example of the tall, long-headed, and long-faced Mediterranean prototype which, brachycephalized by Alpine admixture, is at the basis of the Armenian population.

FIG. 4 (2 views, Photo Wm. M. Shanklin). A Cherkess (Circassian) from the northwestern Caucasus. The Caucasic peoples include in their racial repertoire a strong brunet Mediterranean element of the type shown above; this is especially prevalent among the Cherkesses, of whom this individual apparently forms a good example. One cannot be sure, however, in view of his kalpak, that he has not been partly brachycephalized.

FIG. 5 (1 view, tempera painting by Iacovleff). This magnificent head by Iacovleff illustrates an extreme example of the long-faced Mediterranean type characteristic of the Turkomans, who inhabit, besides the plains of Turkestan, some of the mountain districts of northern Iran and Afghanistan.

FIG. 1

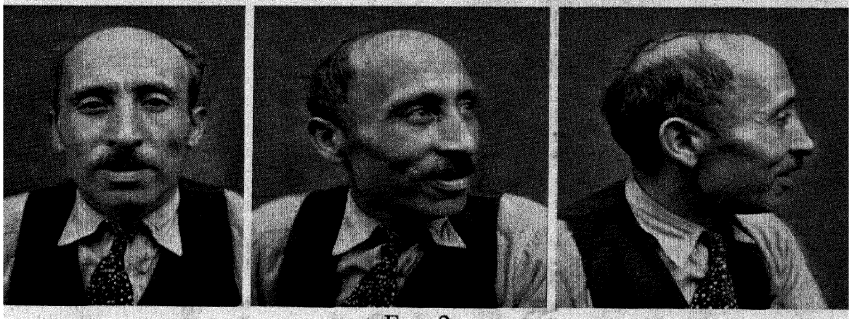


FIG. 2

FIG. 3

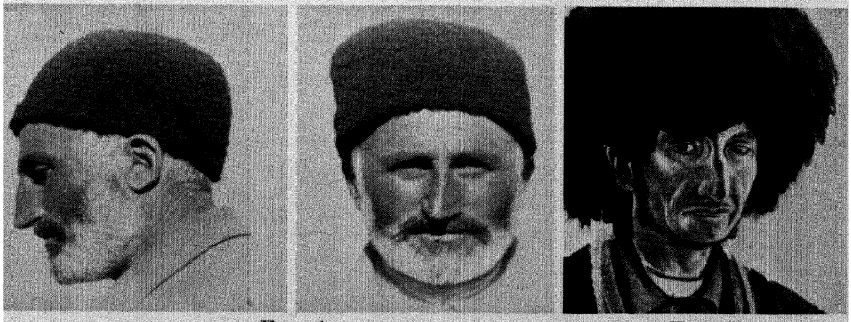


FIG. 4

FIG. 5

Plate 18

LONG-FACED MEDITERRANEANS OF THE WESTERN ASIATIC HIGHLANDS: THE IRANO-AFGHAN RACE

The individuals shown in the preceding plate might be generally classified within the Irano-Afghan branch of the Mediterranean race, the main diagnostic features of which are an extreme vault length, face height, and nose height. In many instances extreme nasal convexity and prominence, and in others an extremely high cranial vault, are additional features.

FIG. 1 (2 views, photo Henry Field. Courtesy of the Field Museum of Natural History, Chicago). A Lur from Luristan, Iran. This Persian tribesman shows in exaggerated degree the great nasal prominence often associated with this branch of the Mediterranean race, and endemic among many Near Eastern peoples. Not only is the nose convex and salient, but also the forehead is sloping, and the chin receding, although the mandible is deep.

FIG. 2 (1 view, tempera painting by Iacovleff). The same racial characters, typical among Kurds, appear in this Baghdadi Kurd in less exaggerated form.

FIG. 3 (1 view, tempera painting by Iacovleff). Although one cannot be sure of the head form of this venerable Persian official from Teheran, his facial features are characteristically Irano-Afghan.

FIG. 4 (2 views, photo Gordon T. Bowles). A Mohmand tribesman from eastern Afghanistan. The Afridis and Mohmands of the Khyber Pass country, the traditional harriers of the Northwest Frontier Province, are of the same racial type, for the most part, as the Persians and the Afghanis. This individual might be a brother of the Luri (Fig. 1) from the opposite end of the Irano-Afghan plateau.

FIG. 5 (1 view, tempera painting by Iacovleff). An Afghan, the "son of a nomadic chief." This youth possesses the high, narrow cranial vault common to one variety of the Irano-Afghan race.

FIG. 6 (2 views, photo Wm. M. Shanklin). A tribesman from the desert border of northeastern Syria, this gray-bearded man possesses the high cranial vault mentioned above.

FIG. 7 (2 views, photo Gordon T. Bowles). Closely similar to the Syrian desert border tribesman is this Afridi from eastern Afghanistan. Its high, narrow cranial vault, in combination with a great facial and nasal height, and its general cast of cranial features makes this type nearly identical with that of the Corded people who invaded Europe from the east toward the beginning of the third millennium B.C.

FIG. 8 (1 view, tempera painting by Iacovleff). This Persian from Teheran seems to belong to the same general branch of the Irano-Afghan race as the two preceding. The great length of his nose is an attribute of senility as well as a racial character.

FIG. 1

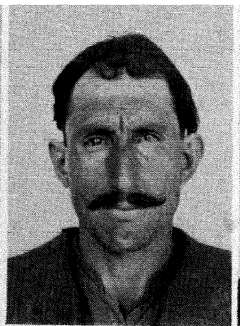


FIG. 2

FIG. 3

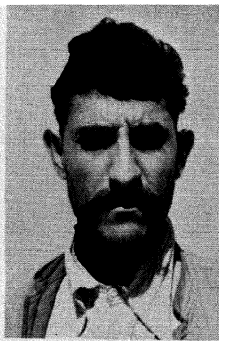
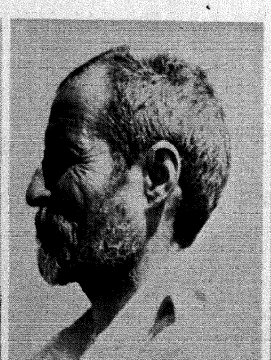


FIG. 4



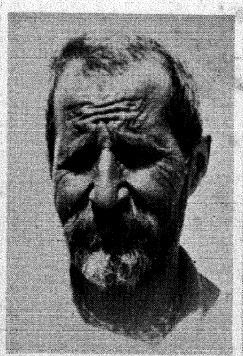


FIG. 5

FIG. 6

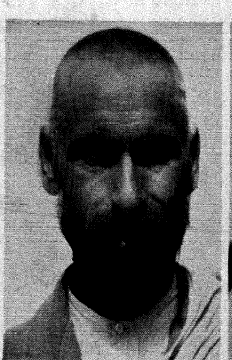


FIG. 7

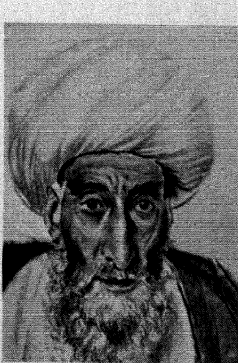


FIG. 8

Plate 19

GYPSIES, DARK-SKINNED MEDITERRANEANS, AND SOUTH ARABIAN VEDDOIDS

The Gypsies, who are believed to have left their home in the lower Indus Valley about the turn of the present millennium, and who arrived in Europe some four centuries later, belong, when comparatively unmixed, to a dark-skinned, small-bodied racial type of general Mediterranean appearance which is common in India.

FIG. 1 (2 views, photo V. Lebzelter, from "Anthropologische Untersuchungen an serbischen Ziguenern," **MAGW,** vol. 52, 1922). A nomadic Serbian Gypsy, apparently relatively pure, who shows the characteristic Gypsy combination of straight jet black hair, black eyes, and dark skin, in connection with Mediterranean facial features.

FIG. 2 (2 views). An English Gypsy of the Cooper family, whose ancestors moved to New England a century ago Although some of the Coopers and Stanleys are blue-eyed and show other signs of non-Gypsy mixture, this individual possesses a sallow brownish skin, straight, coarse, shiny black hair, and dark brown eyes. He is apparently a relatively pure representative of the Gypsy prototype.

FIG. 3 (2 views). Of much greater antiquity outside of India is a dark-skinned, black-eyed, and straight-haired Mediterranean type which appears with some frequency in southern Iraq and along the coasts of the Persian Gulf. This young sailor from Kuwait will serve as an example. The origin and affiliations of this type have not as yet been fully explained.

FIG. 4 (2 views). In southern Arabia, south of the Ruba' el Khali desert, the populations consist of a Mediterranean upper stratum overlaid upon a non-white racial group whose affinities are with the Vedda of Ceylon, and the curly-haired aboriginal tribes of southern India; more remotely, it possesses strong connections with the aborigines of Australia. The individual shown in Fig. 4 is an extreme example of this Veddoid prototype. Note the great prognathism, the ringlet hair form, the extreme nasion depression, and the general form of the nose and lips. Except for his light unexposed skin color, this individual, who is quite brown where exposed, could pass for an Australian aborigine.

FIG. 5 (2 views). A coarse type of Hadhramauti, who represents a mixture between the Veddoid element shown above and the Mediterranean race; or who might be called a less extreme example of the former.

FIG. 6 (2 views, photo Wm. M. Shanklin). A coarse, dark-skinned type of Ruwalla Bedawi. Among the North Arabian Bedawin, besides the more delicately formed Mediterranean types already observed, occur individuals who seem to show relationships with the Veddoid element on the other side of the desert, and perhaps also with the deeply pigmented element of southern Iraq, as exemplified by Fig. 3. Tribes and populations possessing these racial elements do not possess the normal 25 per cent of incipient blondism characteristic of most Mediterranean groups.

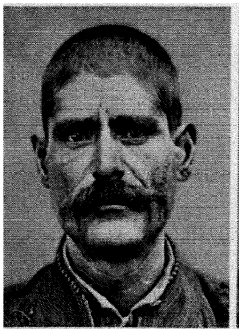
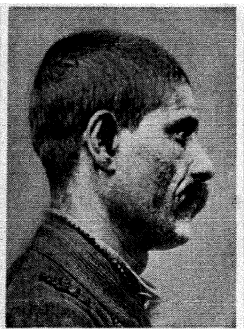


FIG. 1



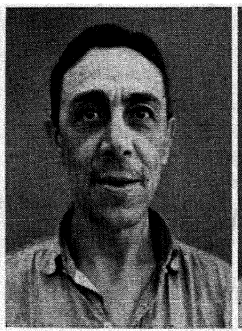


FIG. 2

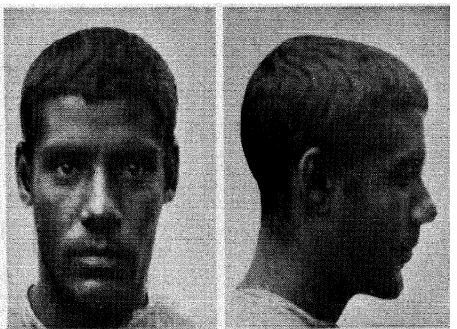


FIG. 3

FIG. 4

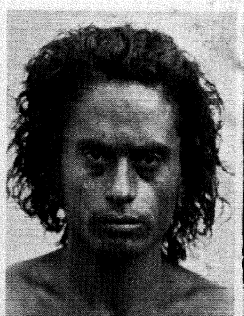


FIG. 5

FIG. 6

Plate 20

THE NEGROID PERIPHERY OF THE MEDITERRANEAN RACE

In the deserts and highlands of Ethiopia, Eritrea, and the Somalilands is found a concentration of several related Mediterranean types, mixed in varying degrees with negroes. To the west these partial whites border on Sudanese negroes; to the southwest, the partially Hamitic tribes of Kenya and Uganda form an extension of the peripheral Mediterranean racial area. To the north, the Beja-Bisharin group of Hamitic-speaking nomads connect the East African Hamitic-speaking peoples with their wholly white Egyptian and Berber relatives of North Africa.

FIG. 1 (2 views). A Somali from the tribe of Mahmud Grade, British Somaliland. This Somali represents the closest approximation to a white man found among his people. The extreme narrowness of his head and face, the straight nasal profile, and the prominence of his chin, mark him as less negroid than many of his fellows. At the same time his skin is nearly black, his hair curly but not frizzly. The type to which this Somali belongs is ancient in East Africa, as shown by the excavations of Leakey in Kenya. It is a specialized, locally differentiated Mediterranean racial form.

FIG. 2 (2 views). Closer to the standard Mediterranean type of Arabia and North Africa is this senile Agau, a member of a fast diminishing group of Hamitic-speaking aborigines in the kingdom of Gojjam in northern Ethiopia. Although his skin is dark, his hair is nearly straight, and his measurements as well as his cranial and facial features are purely or almost purely Mediterranean. He shows no visible signs of negroid admixture, although from a purely genetic standpoint some must be present.

FIG. 3 (2 views). This individual is a tall, slender Semitic-speaking Ethiopian from the kingdom of Shoa. Except for his hair form he is essentially white and Mediterranean. His skin is a sallow yellowish, of a hue often seen among attenuated negro-white hybrids in America.

FIG. 4 (2 views). A Hamitic-speaking Wollega Galla, frizzly haired but otherwise not specifically negroid. There is a non-negroid brachycephalic strain in Ethiopia, with heavy browridges and a strong facial bony structure. This individual shows some traits characteristic of this element.

FIG. 5 (1 view, © Karakashian Bros. Tropical Photo Stores, Khartoum). The Mediterranean quality found among the partly negroid Beja and Bisharin is most evident in the female sex. Their bodily build and breast form, as well as their facial features and hair form, show this especially. This Baggara woman from the Anglo-Egyptian Sudan is less negroid than the majority.

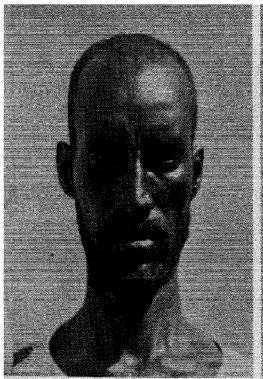


FIG. 1

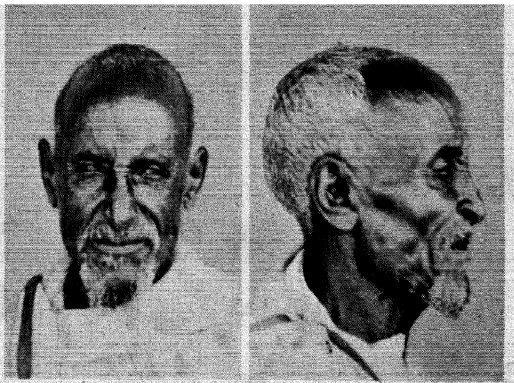


FIG. 2

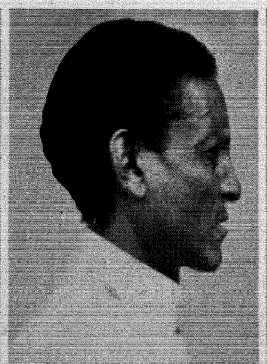


FIG. 3

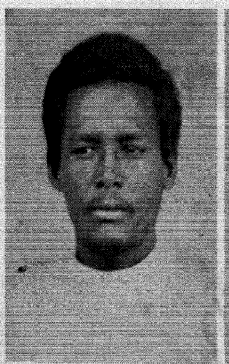


FIG. 4

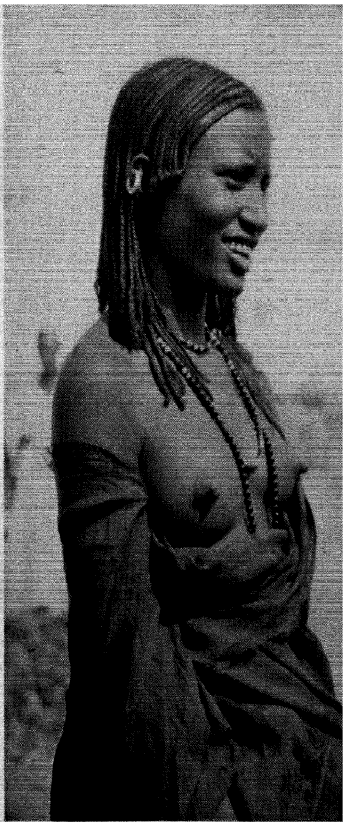


FIG. 5

Plate 21

MEDITERRANEANS FROM NORTH AFRICA

FIG. 1 (2 views, photo Aleš Hrdlička. From Hrdlička, A., *Anthropometric Survey of the Natives of Kharga Oasis*, Egypt; **MCSI,** vol. 59, #1, Washington, D. C., 1912, pl. 14). An oasis dweller from Kharga. This extremely dolichocephalic, low-vaulted, and relatively low-nosed Mediterranean sub-type is typical of the inhabitants of the oases of the Libyan desert, in Siwa and Awjla, where Berber is spoken, as well as in Arabic-speaking Kharga.

FIG. 2 (2 views, photo N. Puccioni. Puccioni, N., *Anthropometria delle Genti della Cirenaica*, Firenze, 1936, Tab. XVI, #277). A tall, slender North African Arab from the tribe of el Ḥasa in Cyrenaica. The narrow, prominent nose, the sloping forehead, and the protruding occiput are features typical of the nomadic Arabs of North Africa from Cyrenaica to the Atlantic.

FIG. 3 (2 views, from Zeltner, F. de, "A Propos des Touareg du Sud," **RA,** vol. 25, 1915, p. 172; Fig. 3 from original blocks). A young Bourzeinat Tuareg, from the region of Timbuctu; this southern Tuareg shows clearly the Mediterranean character of this Saharan Berber people. Pictures of unveiled Tuareg men are very rare.

FIG. 4 (2 views, photo H. H. Kidder). A moderately tall, long-faced Algerian Kabyle.

FIG. 5 (2 views). A small Mediterranean who may be taken as a type example of this race in its North African form. This individual is a Shluh Berber from the Sous, southern Morocco.

FIG. 6 (2 views). An equally standardized Mediterranean from the Riffian coastal tribe of Beni Itteft, northern Morocco. These two individuals may be considered representatives of the Mediterranean invaders who entered western Europe over Gibraltar in the Neolithic.

FIG. 1

FIG. 2

FIG. 3

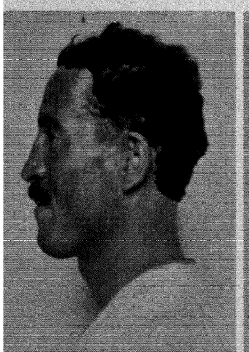


FIG. 4

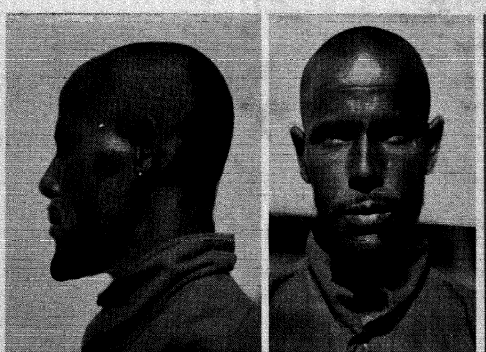


FIG. 5

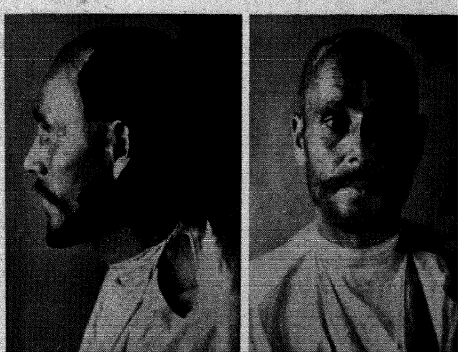


FIG. 6

Plate 22

SMALL MEDITERRANEANS OF SOUTHERN EUROPE

The earliest Neolithic invaders of the southern fringe of Europe were brunet Mediterraneans of small to moderate stature and moderate head size. Unaltered representatives of this type or group of types may be found today from Crete to Portugal.

FIG. 1 (3 views). A native of Crete, a perfect representative of the small Mediterranean race, similar metrically to the Mediterranean Yemenite Arabs shown on Plate 16, and identical, as nearly as can be determined, with the mean type of Cretans in Minoan times.

FIG. 2 (3 views). An equally typical example of the same racial strain, from the region of Naples in Italy. The only aberrant feature of this individual is his blue eyes.

FIG. 3 (3 views). A Mediterranean Spaniard; his father is a Galician, his mother a Cuban of unmixed Spanish descent.

FIG. 4 (3 views). A very dark-skinned, large-headed mesocephalic Mediterranean from Beira Alta in Portugal, with heavy beard and body hair. Many of the Portugese belong to this more robust Mediterranean sub-variety, which is also common in southern Italy, and may have been one of the earliest Mediterranean elements to arrive in southwestern Europe.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

Plate 23

ATLANTO-MEDITERRANEANS FROM SOUTH-WESTERN EUROPE

Toward the end of the Neolithic period, the western Mediterranean countries were invaded by seafarers of a tall, exceptionally long-headed Mediterranean variety; some of these invaders passed through the Straits of Gibraltar, whence they also invaded the British Isles and Scandinavia. The accompanying pictures show modern derivatives of this sea-borne type.

FIG. 1 (3 views). A north Italian from Villa Romagno, Piedmont, near Genoa.

FIG. 2 (3 views). A Frenchman from the Midi, a native of Toulouse. The Atlanto-Mediterranean race is an important element in the south of France, but is most frequently partially or wholly brachycephalized by Alpine admixture, of which this individual shows no evidence.

FIG. 3 (3 views). A metrically and morphologically perfect example of the late Neolithic Megalithic or Long Barrow race, the modern Atlanto-Mediterranean, from Azer in Portugal.

FIG. 4 (3 views). A dolichocephalic Spanish Basque from Sexto in the Basque Province. Like many Basques, he is extremely leptorrhine, narrow-jawed, and blue-eyed.

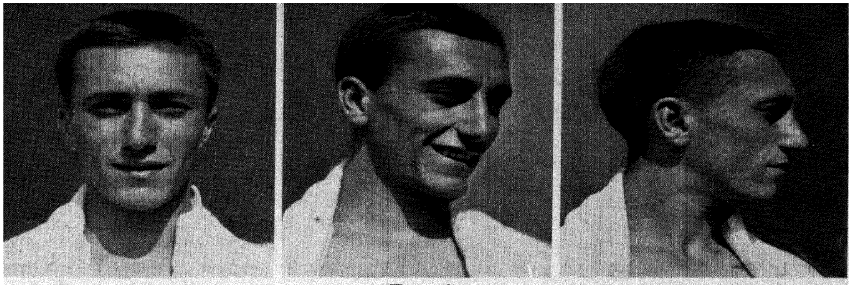


FIG. 1

FIG. 2

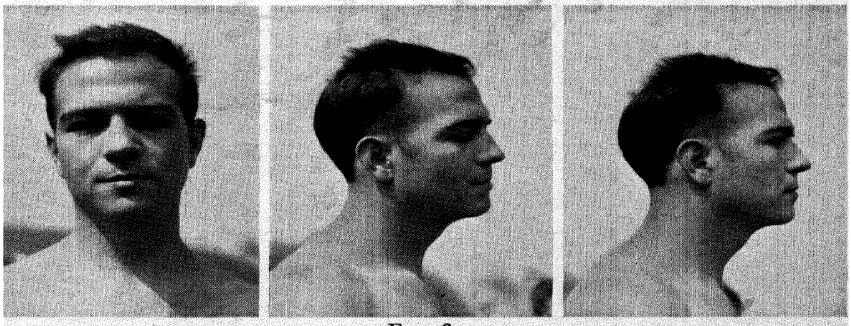


FIG. 3

FIG. 4

Plate 24

BLUE-EYED ATLANTO-MEDITERRANEANS

As was seen in the case of the Basque on Plate 23, there is a tendency in the tall, extremely long-headed Atlanto-Mediterranean race toward a combination of black or dark brown hair and blue eyes. The four men shown on this plate all possess this same pigment combination, all are 170 cm. or over in stature, have head lengths well over 200 mm., and form a unit in regard to general anthropometric and morphological position. All come from regions near the sea, and touched by Megalithic navigators.

FIG. 1 (3 views). A Sicilian from Messina. Aberrant in respect to an excessive mandible width, but otherwise typical.

FIG. 2 (3 views). A Spaniard from Vigo, northwestern Spain.

FIG. 3 (3 views). A black-haired Irishman from County Donegal. The Neolithic invaders of Ireland were apparently all or nearly all of this tall, sea-borne Mediterranean variety. This individual is aberrant in head breadth, but otherwise typical.

FIG. 4 (3 views). A Scotsman from Ayrshire. An excellent example of the British Long Barrow type and a direct Neolithic survival.

FIG. 1

FIG. 2

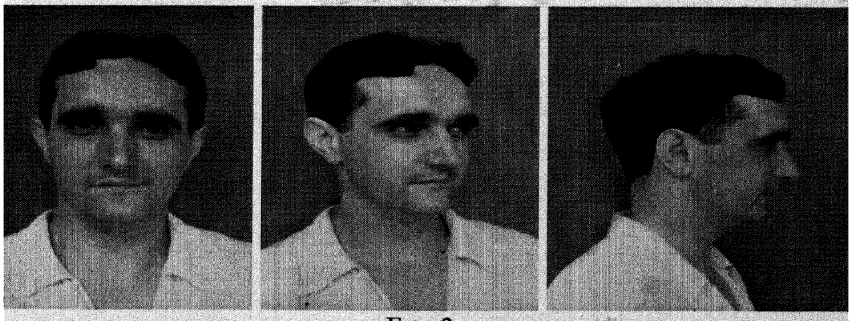


FIG. 3

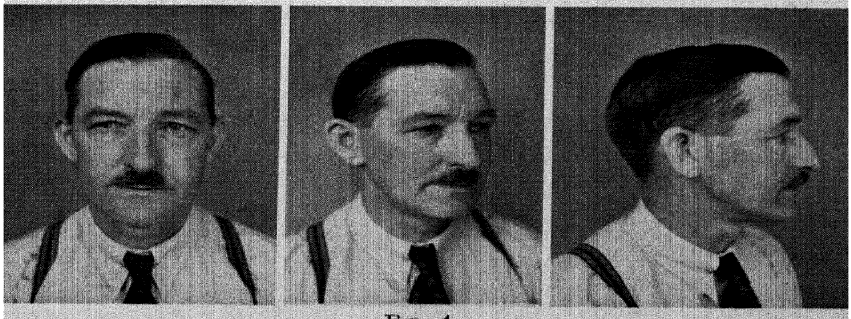


FIG. 4

Plate 25

THE MEDITERRANEAN REËMERGENCE IN GREAT BRITAIN

The Atlanto-Mediterraneans were not the only members of the Mediterranean stock to invade Great Britain; smaller Mediterraneans are commonest in Wales and in the former Cymric territory which stretches from the Midlands to Glasgow. With the rise of the industrial revolution, the population increased greatly in these two last named regions, which became the most heavily industrialized areas in Britain; hence the Mediterranean increment in the British population has risen during the last century and a half.

FIG. 1 (3 views). A Lancastrian from Blackburn, a slender, delicately built Mediterranean with an extremely narrow nose and mandible. He represents a characteristic Midlands type.

FIG. 2 (3 views). A metrically similar New Englander from a Massachusetts coastal city, of Colonial Yankee lineage. He represents a reëmergence or survival within the New England stock of the same British Mediterranean element.

FIG. 3 (3 views). A Welshman from the neighborhood of Cardiff. An absolutely great head length, a heavier facial structure, and a less leptorrhine nose form indicate a different Mediterranean sub-type from the two above.

FIG. 3 (3 views). A Mediterranean Scotsman from Paisley; typical of the industrial population of the Glasgow district.

FIG. 1

FIG. 2

FIG. 3

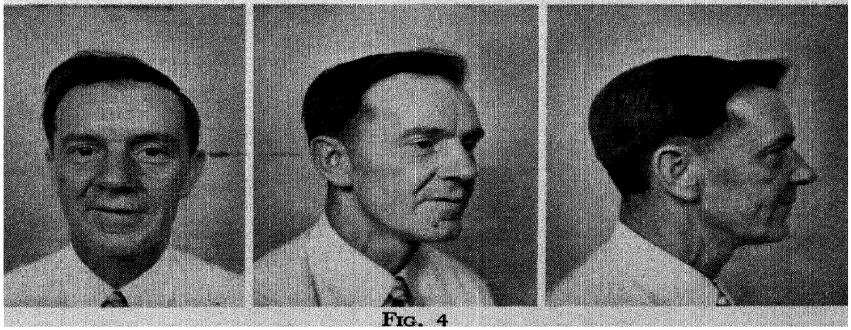


FIG. 4

Plate 26

THE PONTIC MEDITERRANEANS

Along the northern and western shores of the Black Sea are found, among other populations, brunet Mediterraneans of a generalized type, called Pontic by the Russian anthropologists, who are usually of medium to tall stature and who seem related on the one hand to the Atlanto-Mediterraneans and on the other to the long-faced Mediterranean prototype of Asia Minor and the Caucasus Inland from the Black Sea shores they are found sporadically in Russia, Poland, and the countries along the upper course of the Danube. They also seem to form an early population level in Serbia and Albania. Their precise archaeological history has not yet been traced, and their relationship to the Danubian invaders of central Europe at the beginning of the local Neolithic is unknown. They do not, however, conform closely to the physical type of the early Danubians as known to us by a small series of skeletal remains. Much more work needs to be done in southeastern Europe before their historical position and relationships can be established.

FIG. 1 (3 views) A Bulgarian from Chepelare. An excellent example of the Pontic Mediterranean type, except for an unusually small cranial vault. In Bulgaria this Mediterranean type seems actually in the majority.

FIG. 2 (3 views). Photo F. I. Rainer, from Rainer, F. I. *Récherches Anthropologiques dans Trois Villages Carpathiennes*, Bucharest, 1937, Plate II, #3.) A Moldavian farmer. This Mediterranean type is common in Rumania on the plains of Moldavia and Wallachia, as well as in Bulgaria, but is largely replaced by brachycephalic forms in the Carpathians.

FIG. 3 (3 views). This man, who is an excellent example of the type in question, comes from the region of Vilna, and has a Lithuanian father and a Polish mother. He is said to resemble his mother's family. This type is recognized by Polish anthropologists as an element in the population of their country, and is designated by them as Mediterranean.

FIG. 4 (3 views). A Czech of Pontic Mediterranean affiliation, unusual in a population which is for the most part brachycephalic. Bohemia is nearly the last outpost of this type to the west; a few, however, occur in Bavaria.

FIG. 1

FIG. 2

FIG. 3

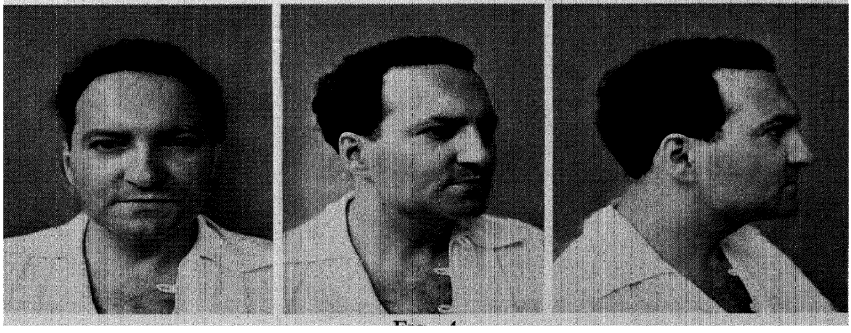


Plate 27

THE NORDIC RACE: EXAMPLES OF CORDED PREDOMINANCE

The Nordic race is a partially depigmented branch of the greater Mediterranean racial stock. It is probably a composite race made up of two or more basic Mediterranean strains, depigmented separately or in conjunction by a progressive evolutionary process. As has been demonstrated on plates 9 and 10, it is impossible, as some European anthropologists believe, to derive a Nordic directly from a dolichocephalic Upper Palaeolithic ancestor of Brünn or Crô-Magnon type. Reduction of these overgrown races produces a result which is quite un-Nordic morphologically as well as in constitutional type. It is the author's thesis that the Nordic race in Europe was caused by a blending of the early Danubian Mediterranean strain with the later Corded element. At the present time both Corded and Danubian elements may be isolated, while other Nordics preserve the blended form. Nordics in eastern Europe, Asia, and North Africa may have been formed by separate recombinations or simple depigmentations of comparable Mediterranean strains, or by invasions of these regions from an European or West Asiatic depigmentation center.

FIG. 1 (3 views). A Finn of predominantly Corded type; note the ash-blond hair and grayish eyes, the great head length, and extremely low cephalic index. In head and face proportions a resemblance is seen to the Corded-like Irano-Afghan sub-type, a resemblance which is enhanced if pigmentation differences are ignored Both metrically and morphologically this individual is seen to be fully Mediterranean; there is no evidence of Upper Palaeolithic admixture.

FIG. 2 (3 views). A Swede from Sonderhamn who represents the same type, and who is very similar in most dimensions. The population of most of Sweden is predominantly Nordic; typical Upper Palaeolithic survivors are numerous only along the southwestern coast.

FIG. 3 (3 views). A Nordic Dane of Jutish parentage who also shows Corded predominance. His face is of extreme length, a trait common among ancient Corded crania. This individual is the son of the classic Borreby man shown on Plate 5, Fig. 1; this is graphic evidence of the fact that ancient racial types may be repeated in toto in individuals of mixed racial ancestry. Only through the agency of such segregation is it possible to present this collection of basic European racial photographs.

FIG. 4 (3 views). New Englander of Colonial British descent. This tall, slenderly built, ash-blond-haired Nordic is an extreme example of the Corded type which entered Britain first during the Bronze Age in conjunction with brachycephals, and later during the Iron Age as an element in the Nordic invading groups. Its presence in New England in 1938 can only be regarded as a complete reëmergence.

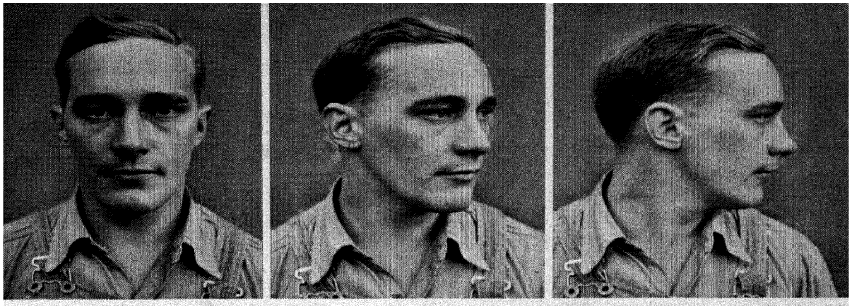


FIG. 1

FIG. 2

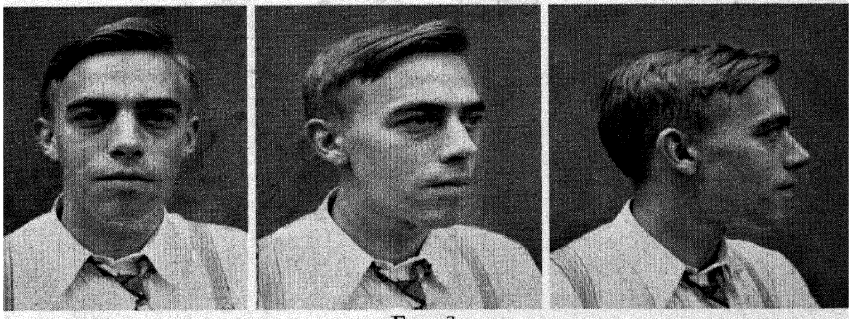


FIG. 3

FIG. 4

Plate 28

THE NORDIC RACE: EXAMPLES OF DANUBIAN PREDOMINANCE

In contrast to the last plate, the present one shows a series of Nordics in whom the Corded element is notably weak or absent, so that an approximation to the earlier, smaller-headed, mesocephalic Danubian strain is perhaps attained. The reason for qualification on this score is that not enough Danubian crania have been found and described to make this point certain.

FIG. 1 (3 views). A Norwegian from Drommen, near Oslo. The head is absolutely of moderate size, comparable to that of small brunet Mediterranean sub-varieties; the stature and bodily bulk are also small.

FIG. 2 (3 views). A mesocephalic Englishman from Southampton, whose small face, concave-profiled, round-tipped nasal form, and whose lack of angularity or bony extravagance in the cranial and facial skeleton, combined with a high vault, indicate a close similarity to the known skeletal remains of Neolithic Danubians.

FIG. 3 (3 views). A Galician of mixed Ukrainian and Polish parentage; an excellent example of the Danubian type, bound to the soil since the Neolithic, which has re-emerged throughout the entire length of the rich agricultural plain which stretches across southern Poland and Russia, while Nordics proper have for the most part moved elsewhere.

FIG. 4 (3 views). A Lithuanian, who although brachycephalic, belongs essentially to the same Danubian type.

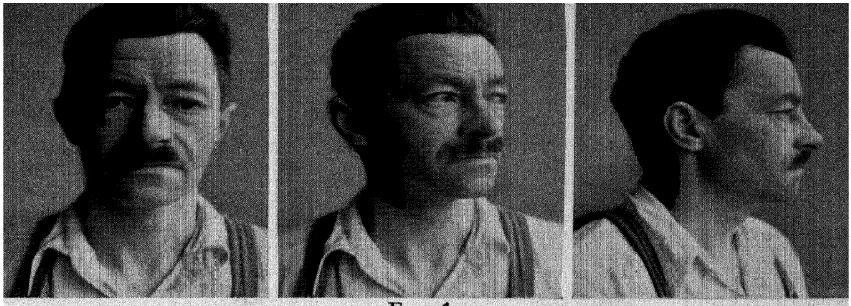


FIG. 1

FIG. 2

FIG. 3

FIG. 4

Plate 29

THE NORDIC RACE: HALLSTATT AND KELTIC IRON AGE TYPES

FIG. 1 (2 views, Bryn and Schreiner, *Somatologie der Norweger*, Table 27, Fig. 81). A Norwegian from Drangedal of standard, Eastern Valley type as specified in Chapter 9, section 4. This is the type associated with the Hallstatt Iron Age remains in central Europe, and which probably did not enter Scandinavia much before the middle of the first millennium B.C. It has since been largely replaced in central Europe, but has found a refuge in Sweden and in the eastern valleys of southern Norway.

FIG. 2 (2 views). An Englishman from the neighborhood of London, who belongs to exactly the same central Nordic type. In England this type is largely of Anglo-Saxon and Danish inspiration.

FIG. 3 (2 views). An East Anglian from Ipswich, Suffolk. More of the English belong to this locally older Keltic Iron Age type, which came from southwestern Germany with the Kelts and is differentiated by a lower cranial vault, a more sloping forehead, and greater nasal prominence. The hair color is more frequently brown than light blond.

FIG. 4 (2 views, photo C. W. Dupertuis). The Iron Age Nordic type is particularly important in Ireland, which was never strongly invaded by Germanic-speaking Hallstatt Nordics. This individual, a man from County Clare, with his sloping forehead, aquiline nose, and brown hair, is an excellent example.

FIG. 5 (2 views, photo C. W. Dupertuis). A special population, largely the product of isolation, has developed in the Aran Isles. Here a local Nordic type of great vault length and exceptionally low vault height, great facial and nasal length, and an excess of blue eyes and golden and red hair, has developed. The young man shown in this figure is an excellent example of this type.

FIG. 6 (2 views, photo C. W. Dupertuis). The Aran Islander shown in this figure is relatively brunet for his group, and has the exceptionally low auricular head height of 110 mm. He illustrates the principle that the low-headed factor is borne by the least blond element in the Aran population. Note the convergent temporal planes and the cylindrical profile of the vault when seen in the front view. This feature, in less exaggerated form, is a cranial diagnostic of the Keltic Iron Age type in general.

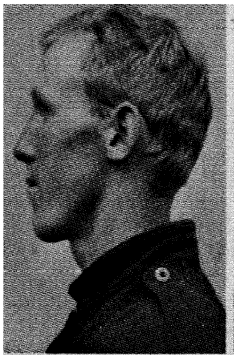


FIG. 1

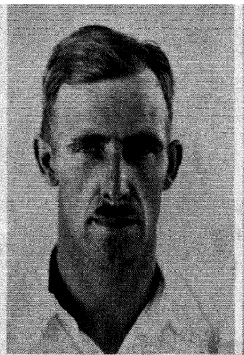
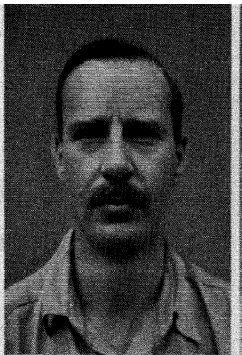


FIG. 2



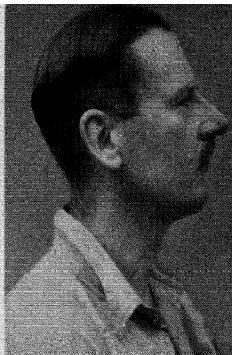


FIG. 3

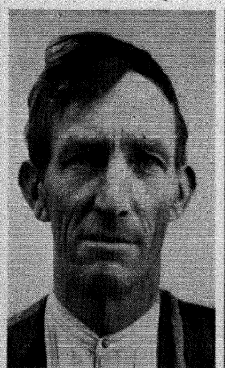


FIG. 4

FIG. 5

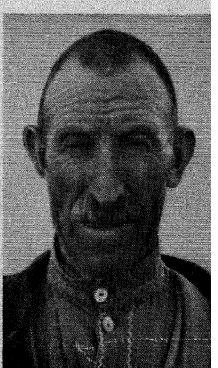


FIG. 6

Plate 30

EXOTIC NORDICS

On this plate are shown portraits of Nordics from places distant from the present northwestern European center of Nordic concentration.

FIG. 1 (3 views). A Russian of the upper class from the Kharkov Government in southeastern Russia. His home is a secondary Nordic center, and probably has been a Nordic concentration point since the days of the Scythians. Nordics are common in what used to be the upper social levels in Russia; this may be ascribed largely to the retention of an original Slavic racial condition, and partly to the infusion of Scandinavian blood at the time of the formation of the Russian nation. Other Nordic increments may have been absorbed from both Iranians and Finns.

FIG. 2 (2 views, photo B. N. Vishnevsky). A Chuvash from the Chuvash Republic, eastern Russia. The Chuvash, who are Tatarized Finns, include both partially mongoloid forms, as shown on Plate 3, and also Nordics and Nordic-Ladogan hybrids. The Chuvash shown here is a Nordic of a long-faced, narrow-nosed type, and his Nordic character may be either ancestrally Finnish or else derived from the Iranian and Turkish-speaking Nordics of central Asia, brought in both by Scytho-Sarmatians and by Turkish invaders.

FIG. 3 (1 view). An Albanian Nordic from the Gheg tribe of Luma. Nordics, rare in Albania, are most frequently found in the tribe of Luma, on the northeastern Albanian border, where there are traditions of the settlement of Völkerwanderung Germans, and where early Slavic influence is strong.

FIG. 4 (3 views). A Portuguese from Tras os Montes, who shows strong Nordic tendencies. Nordics occur occasionally in northern Portugal as well as in northern Spain; from the days of the Keltic migrations onward, there have been Nordic invasions and settlement in the northern part of the Iberian Peninsula.

FIG. 5 (2 views). A Riffian from the coastal village of Ajdir, in the tribe of Beni Urriaghel. In pigment, in measurements, and morphologically this Riffian is as perfect a Nordic as one could find in northern Europe. Nordics are as ancient in North Africa as the Egyptian monuments of the Middle Kingdom, and perhaps older. They survive today mostly in the mountains of the Rif, but others are found in the Canary Islands, and the Djurdjura and Aures mountains of Algeria.

FIG. 6 (1 view). A Kabyle from northern Algeria, a smaller-headed North African Nordic.

FIG. 1

FIG. 2 FIG. 3

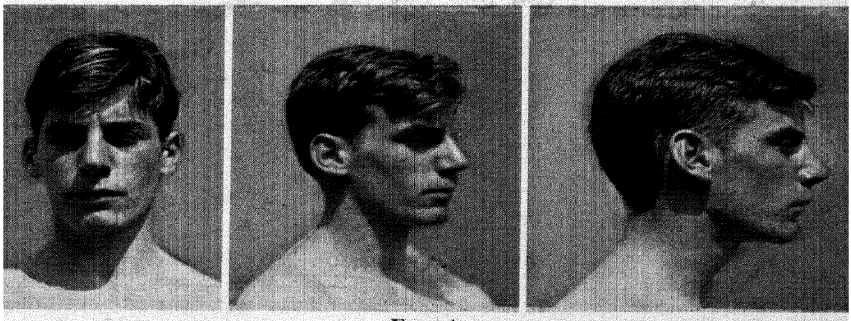


FIG. 4

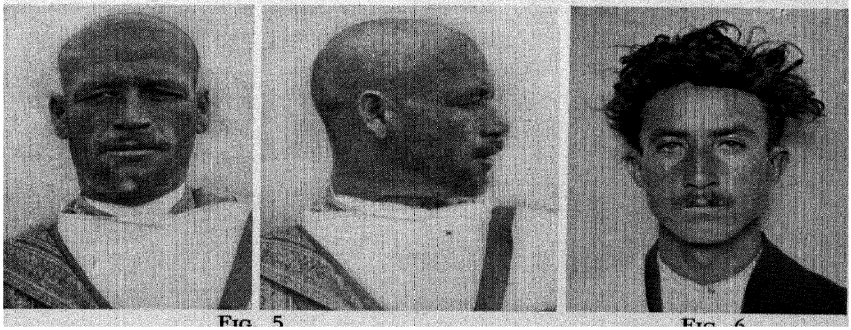


FIG. 5 FIG. 6

Plate 31

NEO-DANUBIANS

The term Neo-Danubian has been used in this work to designate a general class of central and eastern European blond or partially blond brachycephals who seem to be derived in a racial sense from a de-Corded Nordic (and hence Danubian) prototype brachycephalized by Ladogan admixture. This type is very prevalent among modern Slavs of Poland and Russia, and also among some eastern Germans and Austrians.

FIG. 1 (3 views). A White Russian from the Minsk Government.

FIG. 2 (3 views). An Ukrainian from the Volhyn, where this type is especially common. The form of the nasal tip and the upper lip are derived from the Ladogan prototype. These features come out as a rule more strongly among women than among the men.

FIG. 3 (3 views). A German from Saxony, where the Neo-Danubian type is more prevalent than elsewhere in Germany. Note the exceptional narrowness of the interorbital distance, combined with the lowness of the nasal root and bridge, and the extreme brachycephaly. The type represented by this individual is not an intermediate Danubian-Ladogan form, but a recombination.

FIG. 4 (3 views). A brachycephalic Austrian from the neighborhood of Linz, Upper Austria. Although definitely less Ladogan-looking than the other individuals on this plate, this Austrian is seen, upon examination, to possess the Neo-Danubian combination of a nearly globular head form, a low nasal skeleton, a broad, elevated nasal tip, a long, convex upper lip, strong cheek furrows, and blondism. As this and the other individuals on this plate demonstrate, the Neo-Danubian is a variable racial type derived from a blending of the Danubian element in the Nordic combination with eastern European Upper Palaeolithic survivors.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

Plate 32

NORDICS ALTERED BY NORTHWESTERN EUROPEAN UPPER PALAEOLITHIC MIXTURE: I

Throughout the northwestern European area, from the British Isles to the Baltic States, and as far south as southern Belgium, south-central Germany, and the Carpathians, the Nordic race has combined and blended profusely with various types of unreduced Upper Palaeolithic survivors. Examples of such blendings will be seen on this and the next two plates.

FIG. 1 (3 views). A Norwegian from Bergen; metrically for the most part Nordic, but with a high mesocephalic head form, a high cranial vault, and Brünn or Borreby-like suggestions in the formation of the nose and mouth. This is the type called Tronder by the Norwegian anthropologists, owing to its concentration in North and South Trondelagen, on the central Norwegian coast. An "Irish" look is often a feature of this type, showing its relationship to the Palaeolithic element in Ireland.

FIG. 2 (3 views). A Bergen sea captain, of the same general type, brachycephalic owing to an increase in head breadth unaccompanied by length reduction. The Tronder type is usually higher-headed, longer-faced, less dolichocephalic, and heavier in body build and in facial features than the Eastern Valley or Hallstatt Iron Age Nordic type.

FIG. 3 (3 views). Trondelag-like types are by no means confined to Norway. This individual is a Lett from Kurland of predominantly Nordic affiliation, but broader-headed and less delicate of facial features than the classic Iron Age type. Nordics of this general class are common in the Baltic Republics.

FIG. 4 (3 views). A Highland Scot from Morayshire; tall, large-headed, brown-haired, with an extremely long face and a high cranial vault, he represents a local North British Trondelag approximation, either through the absorption of indigenous Upper Palaeolithic elements, or through importation from Ireland with the Gaelic invasions, or from Scandinavia.

Plate 33

NORDICS ALTERED BY NORTHWESTERN EUROPEAN UPPER PALAEOLITHIC MIXTURE: II

FIG. 1 (3 views). A Netherlander from Gelderland in the northern Netherlands. Gelderland and Friesland are the home of overgrown Nordics with long faces and high heads; showing both Corded and Brünn or Borreby tendencies. This individual is absolutely long-headed for a mesocephalic index, and beak-nosed, in accordance with the local type under discussion. He is, however, a relatively little altered Nordic.

FIG. 2 (3 views). A Schleswig-Holsteiner from Elmshorn, on the Danish border. He is a very blond, golden-haired Nordic of relatively great body size, with all lateral dimensions of head and face broadened by Borreby mixture; the morphological features of the head and face, however, remain essentially Nordic.

FIG. 3 (3 views). An equally blond specimen of the same type from Hannover, made much more brachycephalic through a reduction in head length. Nordics, brachycephalized in head form and made larger and more lateral in bodily proportions through Borreby admixture, form the major element in the population of northern and central Germany.

FIG. 4 (3 views). A heavily built Galician Pole, light red haired, and brachycephalic; a Slavic counterpart of the North German type depicted above. He is basically similar to the Ruthenian mountaineer shown on Plate 8, Fig. 1, but shows a more strongly Nordic racial character.

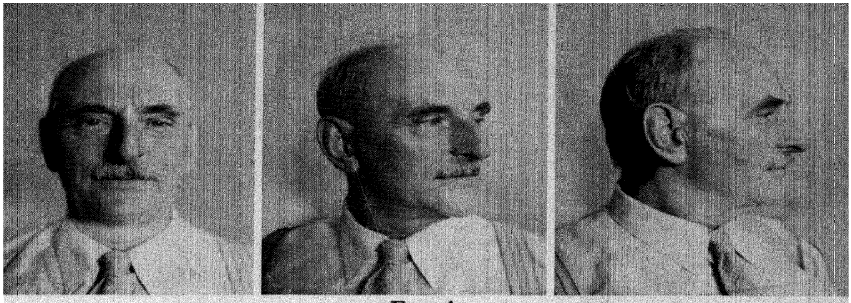


FIG. 1

FIG. 2

FIG. 3

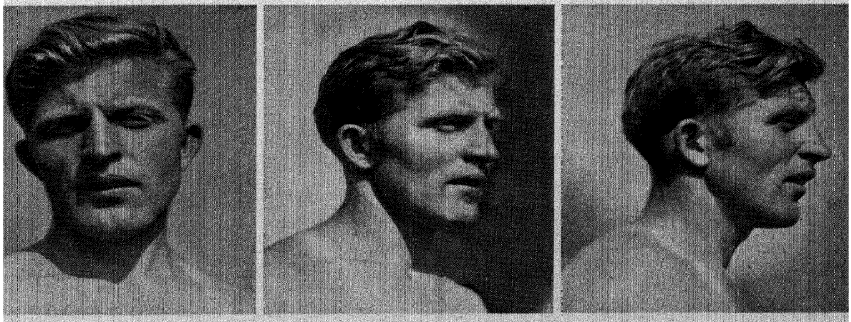


FIG. 4

Plate 34

NORDICS ALTERED BY MIXTURE WITH SOUTH-WESTERN BORREBY AND ALPINE ELEMENTS

In southern Netherlands and in Belgium, as well as in northern France, there is a large-headed brachycephalic element transitional between the Borreby and Alpine forms. (See Plate 13, Fig. 4.) In mixture with Nordics this produces a large-headed brachycephalic or sub-brachycephalic type of only moderate blondism and medium stature.

FIG. 1 (3 views). Southern Netherlander from North Brabant. An excellent example of this altered Nordic type.

FIG. 2 (3 views). A Fleming from West Flanders, Belgium; a light haired and equally representative example. The Flemish people incline more to the Nordic type in eastern Flanders, more to the brachycephalized variety in the west.

FIG. 3 (3 views). A German Swiss from Bern; like many of the Swiss of the Rhine drainage, he is largely Nordic slightly brachycephalized by Borreby or Alpine admixture, or both. These Swiss are more Nordic, as a whole, than the South Germans.

FIG. 4 (3 views). A northern Frenchman, whose father came from the Vosges mountains, and mother from the Department of Indre. Blond, highly brachycephalic, and Nordic in most facial features, this man represents a major element in the population of northern France. This is the type which some French authors call "Galatian." Historically the Nordic element is mainly of Keltic introduction.

FIG. 1

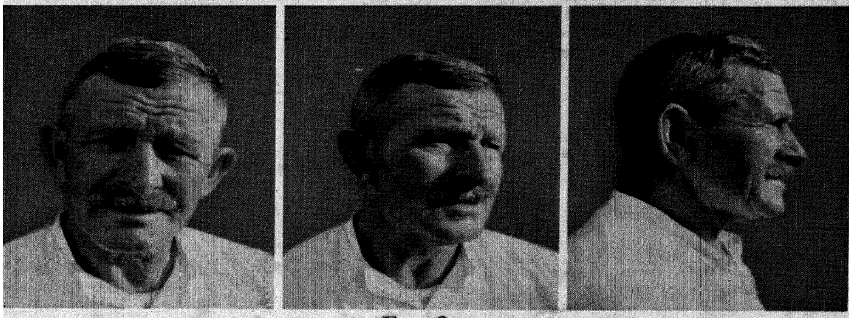


FIG. 2

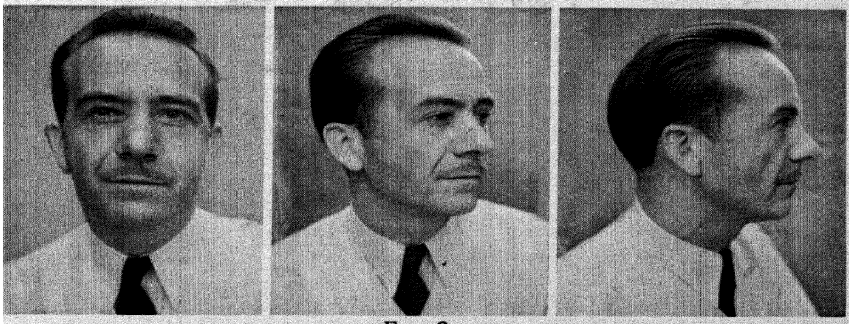


FIG. 3

FIG. 4

Plate 35

THE PRINCIPLE OF DINARICIZATION

From France to Macedonia, and from Istanbul to Samarakand, are found populations in which the majority of persons present a characteristic morphology of the head and face; with a brachycephalic skull, often flattish in the occipital region, the foramen magnum and auricular passages set disproportionately far to the rear, the forehead often sloping, the face frequently elongated, and the nose salient and frequently convex. People who possess these characteristics have been lumped together into one or more races: the Dinaric in Europe, the Armenoid in Asia, and the Noric to include the blond varieties. It is biologically unsound, however, to postulate any historic unity for individuals of these so-called races, since they are products not of an historical association but of a biological principle. That principle is as follows: A mixture of a Mediterranean stock with a 33 per cent, more or less, solution of Alpine may bring about a differential inheritance in the majority of the offspring; from the Alpine side is inherited brachycephaly, often greater than that of the Alpine ancestral factor; the dimensions of the pre-auricular part of the head are derived from the long-headed strain, hence the posterior position of the ear; the breadths of the median sagittal sector of the face are inherited from the narrower-faced ancestor, often in exaggerated degree, and this applies especially to the width of the upper segment of the nose and to the interorbital distance; meanwhile the face often becomes longer than in either parent stock, and the nose, in response to the shortening of the antero-posterior length of the entire head, becomes salient. This process occurs in varying degrees with individuals and with local racial entities of different origin. If the solution is saturated either with Alpines or with Mediterraneans, phenotypically pure members of whichever stock is predominant appear in considerable numbers. If the solution is correct, such apparently pure individuals still occur, but with relative infrequence. This principle, studied in this work in reference to whites, applies to hybrids of other races as well.

It may readily be seen that the Dinarics, Norics, and Armenoids have no ethnic or historic unity, but are for the most part parallel results of the same process repeated with similar materials in different places. They are related only insofar as the parent stocks are related. There is one important exception to this rule, however; during the Bronze Age Dinaricized Mediterraneans spread with the knowledge of metal from an eastern Mediterranean source to the western Mediterranean Countries, to central Europe, and to the British Isles. In this instance Dinarics of a Near Eastern variety did actually invade Europe, and their descendants may be distinguished today in countries like England where, owing to the absence of an Alpine substratum, the process of Dinaricization has not been locally at play.

In this and the following plates, an attempt will be made to illustrate degrees and types of Dinaricization throughout the white racial area of the Old World.

FIG. 1 (3 views). A Dinaricized German from Heidelberg; although his face shows in exaggerated degree all of the criteria of Dinaricization, the great size of his cranial vault is unusual for Dinarics and implies the presence of unreduced Upper Palaeolithic factors. This individual might be called a Noric, since the Mediterranean element concerned is unquestionably Nordic, and probably Nordic of the Corded variety.

FIG. 2 (3 views). A Noric from Berlin; the shallow nasion depression, and the great height and salience of the nose are especially noticeable here. Norics are extremely common in eastern Germany.

FIG. 3 (3 views). A Noric Pole from Galicia. This type is characteristic of many of the southern and western Poles.

FIG. 4 (3 views). A Komi or Zyrian, member of the northernmost of the East Russian Finnish tribes. This individual illustrates the essential Nordic character of the Finns, brachycephalized by some unknown agency.

FIG. 1

FIG. 2

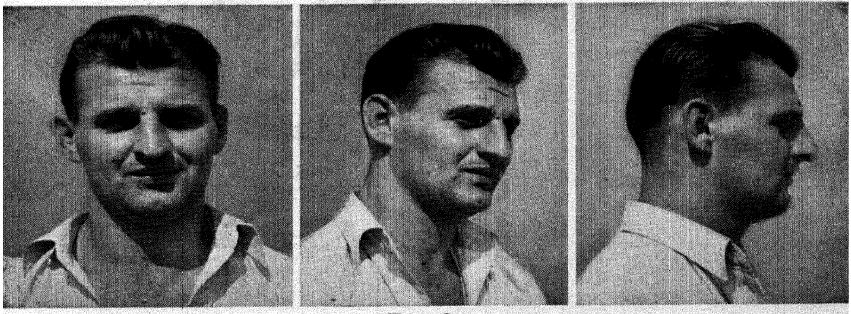


FIG. 3

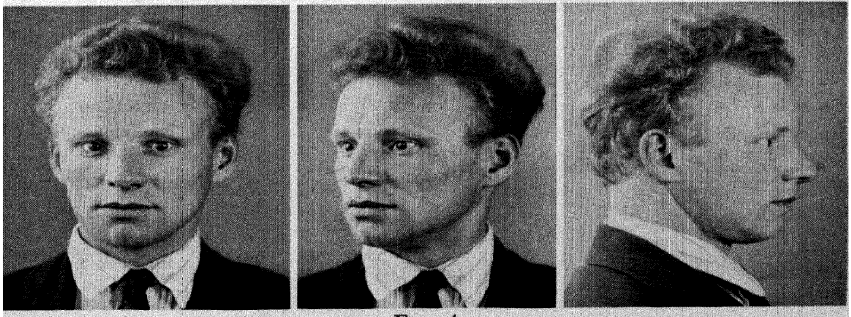


FIG. 4

Plate 36

EUROPEAN DINARICS: I

FIG. 1 (3 views). An Englishman from Yorkshire; an excellent example of the Dinaric seafarers who invaded Britain in the Early Bronze Age. This man may be considered a type specimen of Bell Beaker brachycephal.

FIG. 2 (3 views). A less completely Dinaricized Netherlander from North Brabant.

FIG. 3 (3 views). A Frenchman from Lyon; typical of the local Mediterranean-Alpine product in much of France, especially in the northeastern half of the Republic.

FIG. 4 (3 views). A Slovak from Třsoka, Czechoslovakia. Although the Czechs themselves are predominantly Alpine, the Moravians and Slovaks are frequently Dinaric. This man could easily pass for a Frenchman.

FIG. 1

FIG. 2

FIG. 3

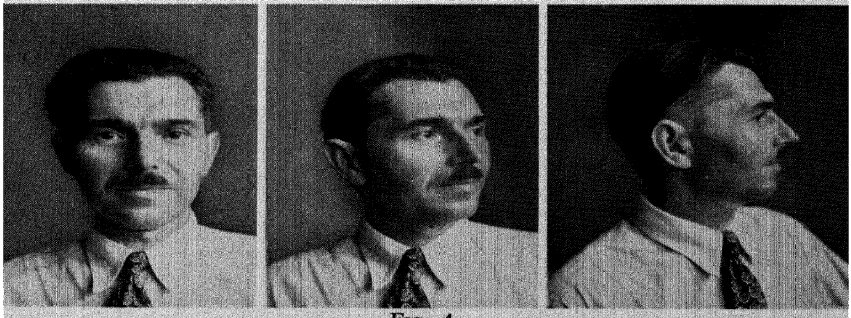


FIG. 4

Plate 37

EUROPEAN DINARICS: II

FIG. 1 (3 views). Another Dinaric Slovak, in this case exceptionally long-faced, in a more exaggeratedly Dinaric manner.

FIG. 2 (3 views). An Italian from the province of Ancona, northern Italy; a Dinaricized Alpine-Mediterranean combination is characteristic of most North and many central Italians.

FIG. 3 (3 views). A similar example from the province of Prozioni, central Italy. These Dinaricized Italians are frequently thick-set and stocky.

FIG. 4 (3 views). A Magyar from Öši, Hungary. This Dinaricized Alpine is more typical of the Magyar people than the Ladogan prototype shown on Plate 2, or the Alpine on Plate 14.

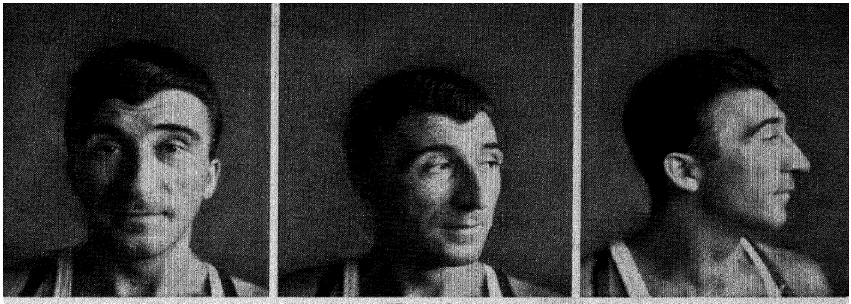


FIG. 1

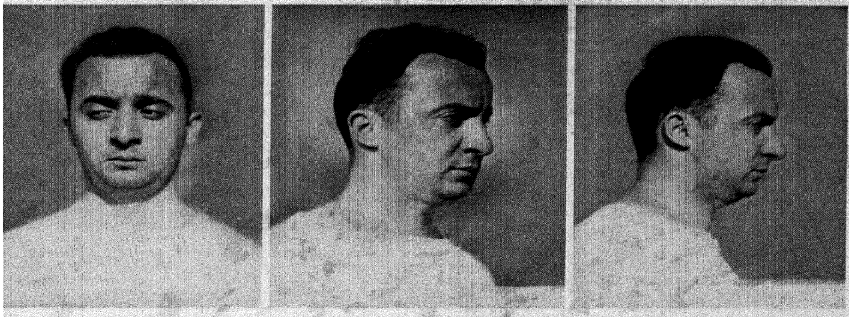


FIG. 2

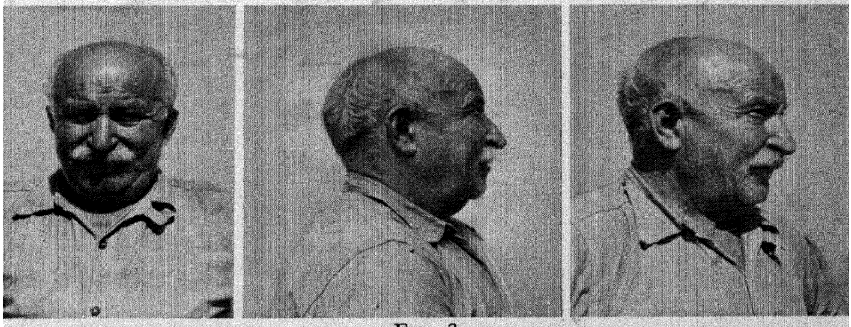


FIG. 3

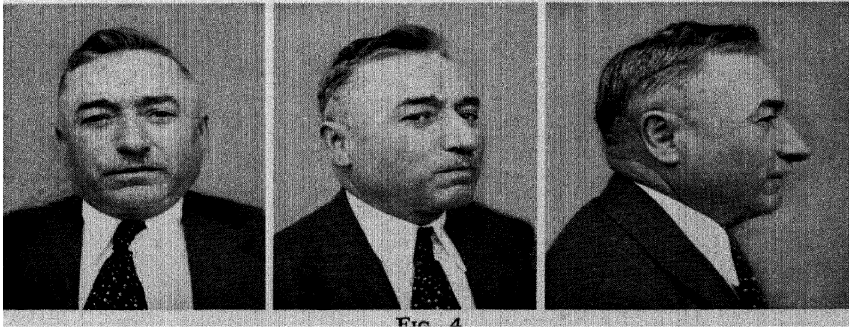


FIG. 4

Plate 38

EUROPEAN DINARICS: III

FIG. 1 (3 views). A Russian nobleman of Polish and Russian descent; although highly Dinaricized, this individual possesses a mandible of exceptional width.

FIG. 2 (3 views, photo F. I. Rainer; from Rainer, F. I., *Enquêtes Anthropologiques dans Trois Villages Roumains des Carpathes*, Plate V-3, Fundul Moldavii #65). A Rumanian from the Carpathian mountain village of Fundul Moldavii in the Bukovina. A classic example of an European Dinaric.

FIG. 3 (3 views). A Croatian from Istria. Aside from the Carpathians, the greatest concentration point of Dinarics proper in Europe is the mountain zone from the Tyrol to Albania. This predominantly blond Croat is an excellent example of the Dinaric population in northwestern Yugoslavia.

FIG. 4 (3 views). A Montenegrin Dinaric. Many of the Montenegrins are very large-headed and show evidences of unreduced Palaeolithic admixture. (See Plate 8.) The present individual is typical of the more strictly Dinaric element in Montenegro; brunet, like most Serbs; and shorter-faced than other Dinarics as, for example, in Albania.

FIG. 1

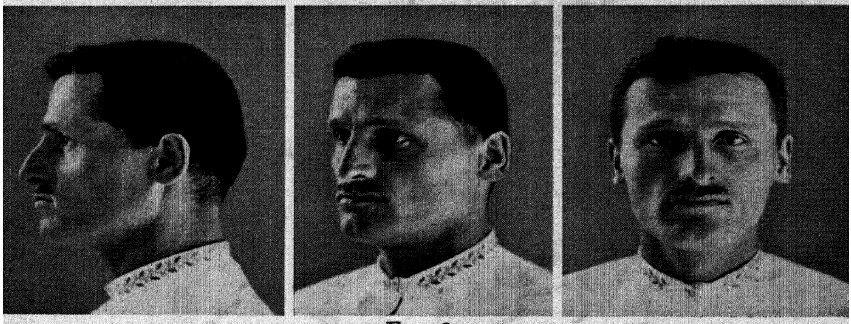


FIG. 2

FIG. 3

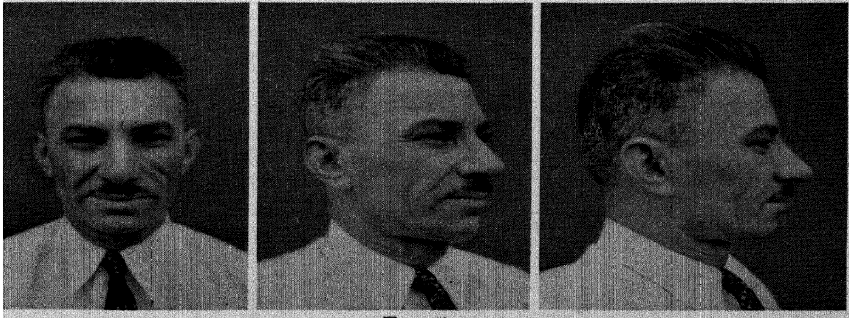


FIG. 4

Plate 39

EUROPEAN DINARICS: IV

FIG. 1 (2 views). A Moslem Serb from Dibra, in Old Serbia. This Serb, like most of his countrymen, is tall, brunet, rather small-headed, and brachycephalic. It would appear that a brachycephalization of the "Pontic" Mediterranean type, shown on Plate 26, is involved.

FIG. 2 (2 views). An Albanian gendarme from Puka, in the center of the Gheg country. This individual, like many Albanians when dressed and coiffured in western European style, looks like a Frenchman.

FIG. 3 (2 views). An exaggeratedly tall, lean, and long-faced Dinaric from Klementi, the northernmost bairak of the tribe of Malsia ë Madhë. Northern Albania is probably the most highly Dinaricized country in Europe.

FIG. 4 (2 views). A blond Gheg from Zadrima; a classic Noric.

FIG. 5 (2 views). An extremely Dinaricized Zadrima Gheg; this individual may be considered an example of the ultimate in Dinaricization.

FIG. 6 (2 views). A Dinaric Greek of Epirote stock, from Gjinokaster in what is now Albania. Many Greeks, especially Epirotes, are Dinarics.

FIG. 1 FIG. 2 FIG. 3

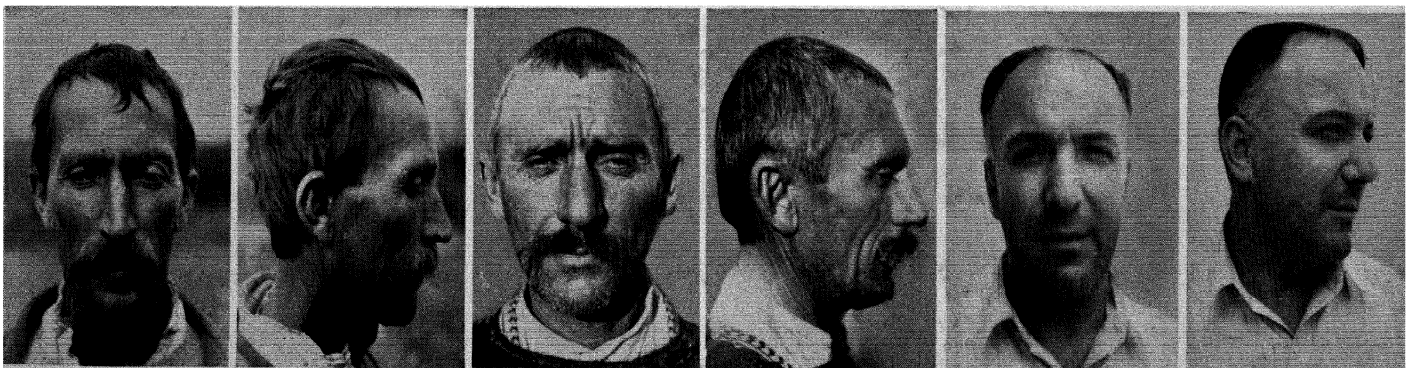


FIG. 4 FIG. 5 FIG. 6

Plate 40

DINARICS IN WESTERN ASIA: I

In Asia Minor, Syria, Armenia, the Caucasus, and Turkestan the reëmergence of a basic Alpine population has Dinaricized the local brunet Mediterranean types shown on Plates 17 and 18. These Asiatic Dinarics are usually called Armenoids, although the distinction is arbitrary, and in the strict sense only the Armenians themselves and others who live in the east deserve that name.

FIG. 1 (3 views). A Turk from Istanbul. Small-headed, hyperbrachycephalic, this individual is an extreme type of Dinaricized Anatolian Turk. The Turks are (a) Mediterraneans of local Cappadocian origin, and (b) intrusive Irano-Afghans, the invading Turkish element proper, Dinaricized by a local Alpine reëmergence. The westernmost Turks are fair to brunet-white in skin color, the eastern Turks grow progressively darker as one approaches Kurdish and Armenian territory.

FIG. 2 (3 views). An equally brachycephalic Turk from Khozat, Anatolia, with a strong trace of eye blondism.

FIG. 3 (3 views). A dark-skinned Turk from Kharput, eastern Anatolia. Kharput is also the home of many Armenians.

FIG. 4 (3 views). An Assyrian from the mountains south of Armenia; the Assyrians are Christians who moved into the mountains from Iraq some 600 years ago, and who are now as brachycephalic as Armenians. Their exact ethnic origin is difficult to determine.

FIG. 1

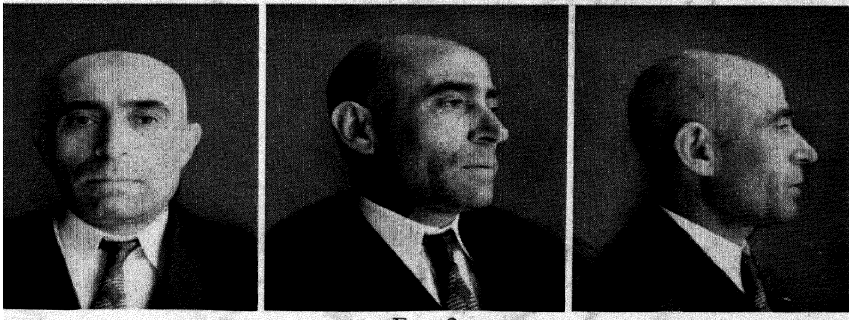


FIG. 2

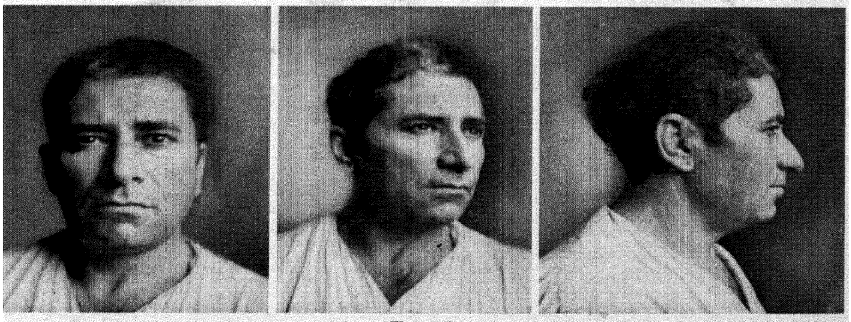


FIG. 3

FIG. 4

Plate 41

DINARICS IN WESTERN ASIA: II

FIG. 1 (3 views). A Syrian from Damascus; a perfect example of a Syrian Dinaric. The Syrians, who are, as a whole, highly Dinaricized, contain Mediterranean elements of Arabian origin as well as the long-faced elements shown in Plates 17 and 18.

FIG. 2 (3 views). A Lebanese from Baalbek, Lebanese Republic. The Lebanese on the whole are more brachycephalic than the Damascenes; this individual is longer-headed than most, and inclines facially toward the Alpine prototype.

FIG. 3 (3 views). A Syrian from the district of Beka'a, with a cephalic index of almost 100. His extraordinary shortness of the cranial vault must be partly due to cradling, a practice which has affected the head form of many Syrians, Armenians, and also probably some Albanians. Cradling, however, is not the cause of Dinaricization, but merely a factor which may intensify it.

FIG. 4 (3 views). A Druze from the Shuf district; facially this individual actually resembles the Yemenis from whom the Druzes as a whole claim descent. His extreme brachycephaly may be partly the result of cradling.

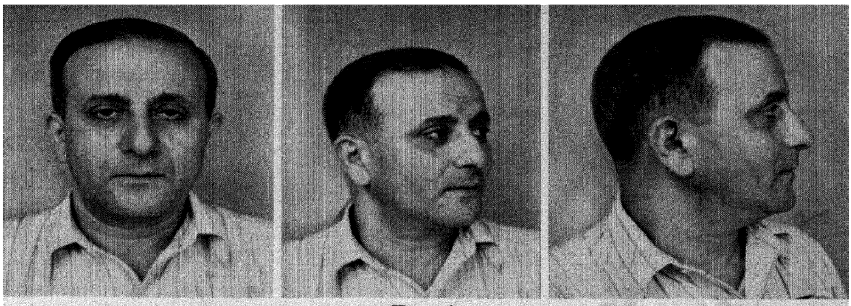


FIG. 1

FIG. 2

FIG. 3

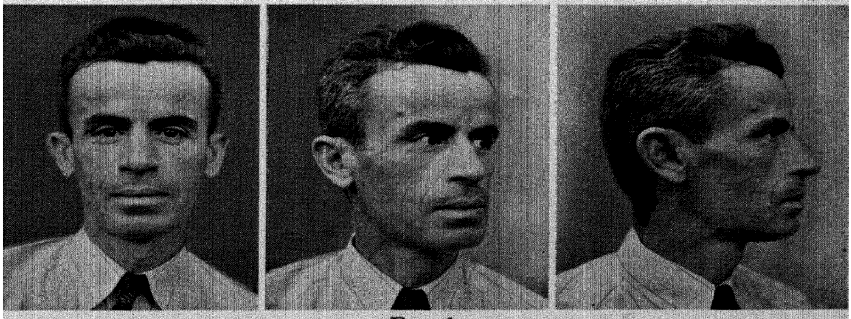


FIG. 4

Plate 42

ARMENOID ARMENIANS

FIG. 1 (3 views). An Armenian from Istanbul, facially a classic Armenoid type. Like many Armenians, he is dark-skinned.

FIG. 2 (3 views). An Armenian from Kharput. Note the extreme face length, a measurement which differentiates Armenians as a group from the shorter-faced Turks.

FIG. 3 (3 views). A tall, slender Armenian from Van; typical of the eastern Armenians, who are lighter-skinned, taller, and longer in all sagittal dimensions of the body, head and face than the western Armenians.

FIG. 4 (3 views). A Van Armenian with pinkish-white skin color, blue eyes, and medium brown hair; although hyperbrachycephalic, this individual shows evidence of the Nordic element which gave the Armenians their Indo-European language.

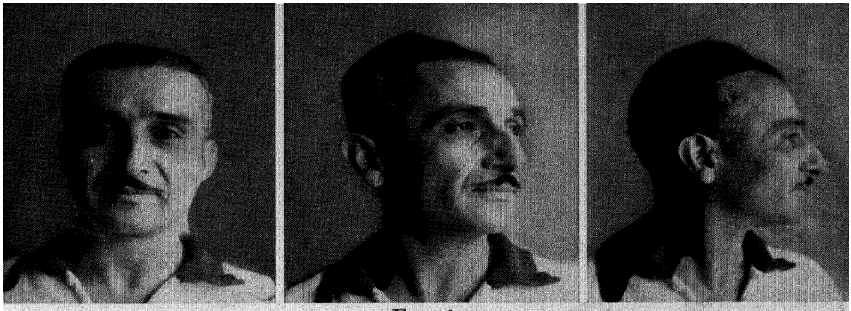


FIG. 1

FIG. 2

FIG. 3

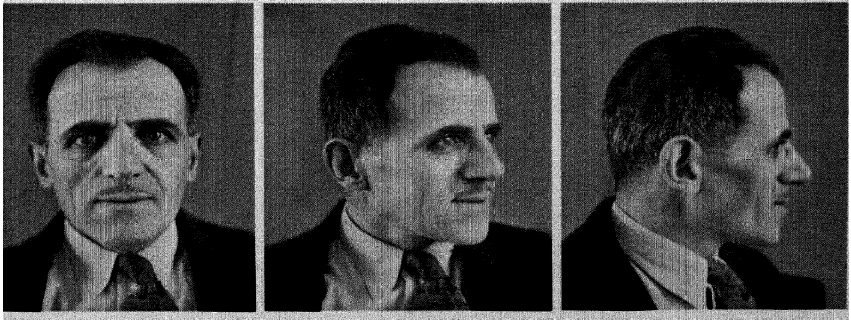


FIG. 4

Plate 43

DINARICIZED FORMS FROM ARABIA AND CENTRAL ASIA

FIG. 1 (2 views). A highly Dinaricized Arab from Jidda, the pilgrim port of Mekka. Typical of the sailor population found in maritime settlements on all Arabian coasts.

FIG. 2 (2 views). An example of the same type found along the Yemen coast.

FIG. 3 (2 views). A Dinaricized Hadhramauti; partially blond. The Mediterranean element in the Hadhramaut is often Dinaricized by mixture with the coarse, Veddoid-influenced type seen on Plate 19.

FIG. 4 (2 views). An extreme example of the maritime Arab brachycephal; from Lenja, opposite Muscat, on the Persian side of the Persian Gulf. This type probably originated in the general Persian Gulf neighborhood, but this is by no means certain.

FIG. 5 (2 views). An Iranian-speaking native of Russian Turkestan, showing a Dinaricized form of the usual Irano-Afghan type found in Iranian territory.

FIG. 6 (2 views. It is possible but unlikely that these two views represent two separate individuals). A lowland Tajik from Samarkand, racially a Dinaricized Irano-Afghan. The early oasis population was probably of Mediterranean type, the brachycephalizing agent being Alpine, from the Pamirs.

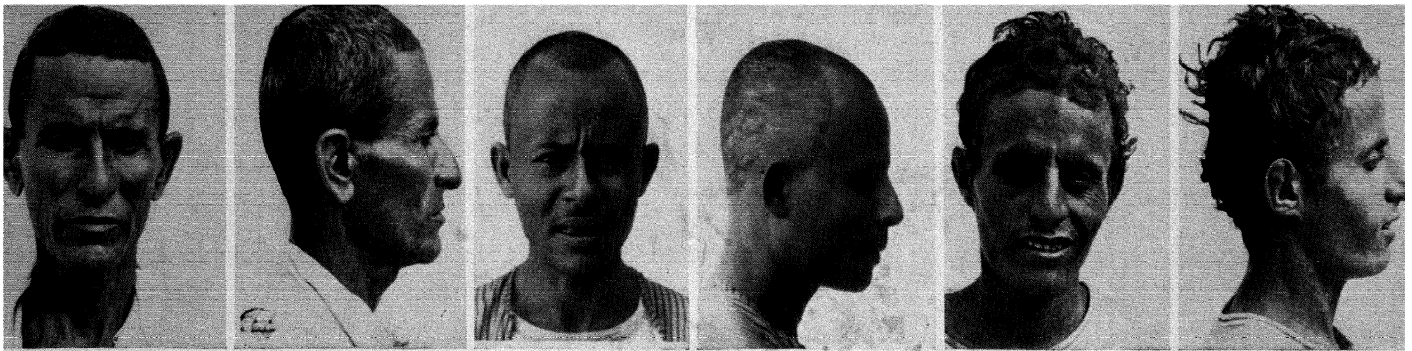


FIG. 1 FIG. 2 FIG. 3

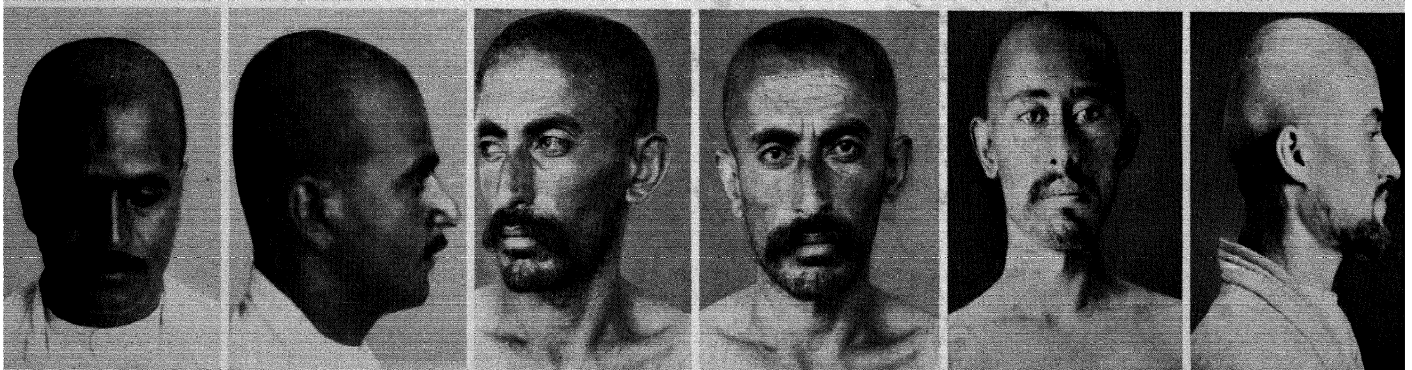


FIG. 4 FIG. 5 FIG. 6

Plate 44

THE JEWS: I

The Jews have been left to the end because they do not as a whole fit into any single racial classification heretofore outlined. Historically the Jews of the Biblical period in Palestine were a Semitic-speaking people composed of various Mediterranean strains which had blended together at the time of the formation of the Jewish nation. These Mediterranean strains must have included a small Mediterranean type comparable to the present Yemeni Arabs; a taller, longer-faced strain with a tendency to nasal convexity, as is found among Irano-Afghan peoples today; and a straight-nosed, presumably Atlanto-Mediterranean element contributed by the Philistines.

The Jews began their expansion from Palestine as early as the time of the Babylonian Captivity; at this time they settled Mesopotamia in large numbers, and from there began an expansion into central Asia of which colonies still remain. In the Hellenistic period they migrated into Asia Minor and the Black Sea region, as well as into Egypt; these emigrants became Hellenistic Jews. Under the Romans they settled in Italy, France, and Spain, with especial concentrations in Spain and in the cities of the Rhineland. The Jews expelled from Spain in 1492 and during previous expulsions became the Sephardim, whose descendants are to be found in various countries bordering on the Mediterranean, especially Morocco, the Salonika region of what is now Greece, and Turkey. The Rhineland Jews, persecuted at the time of the First Crusade, moved eastward into Poland, the Ukraine, and other central European countries, and met there and absorbed a group of Hellenistic Jews moving westward, among whom were some who had lived among the Turkish Khazars in the Crimea and elsewhere. The two groups blended, and the Germanic speech of the more numerous western element prevailed. The modern Yiddish-speaking Ashkenazim are the descendants of this amalgamated body. Racially they preserve to a large measure their Mediterranean character, altered partly by Alpine admixture which has in many cases produced Dinaricization. This Alpine, as well as some Nordic, admixture was probably obtained largely in France and Germany before their departure eastward. The most persistent Palestinian Mediterranean traits which the Jews preserve is a narrowness of the face. The Jewish facial expression, by which many Jews may be distinguished, is a cultural and not a genetic character.

FIG. 1 (1 view, photo W. E. Forbes). A group of Yemenitic Jews photographed in Sana'a, the Capital of Yemen. These Jews are derived from more than one early Jewish source, but the bulk of their ancestors left Palestine for Arabia very early. Their purely Mediterranean and essentially Jewish facial and cranial character may be easily observed. They probably come as close to the original Jewish prototype as do any living Jews.

FIG. 2 (1 view). The Sheikh of the Jewish village of Zerekten, Glawa tribe, Atlas Mountains, Morocco. These Berber-speaking mountain Jews have lived in Morocco since not only pre-Islamic but probably also pre-Christian times; nevertheless they are easily distinguishable from the Berbers with whom they live. The sheikh here represented is aberrantly brachycephalic.

FIG. 3 (1 view). A much more typical mountain Jew from the same colony.

FIG. 4 (1 view). A group of Berber-speaking Jews. The man on the left has a concave nasal profile; he belongs to a coarser Mediterranean type than does the man in Fig. 3, or the tall Yemenitic Jew in Fig. 1.

FIG. 1

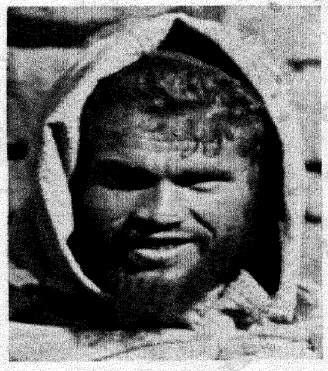


FIG. 2

FIG. 3

FIG. 4

Plate 45

THE JEWS: II

FIG. 1 (3 views). A Sephardic Jew from Alexandretta, Asia Minor. Facially this Spanish-speaking Jew is a good example of the Sephardic Mediterranean type; his cephalic index, however, is extremely high, owing to an absolute shortness of the cranial vault. The interorbital distance is very narrow, as are all facial widths.

FIG. 2 (3 views). An American Ashkenazic Jew (Massachusetts) whose parents were born in the Ukraine. Brown-haired and blue-eyed, and slightly brachycephalic, he still preserves the facial features of a Palestinian Mediterranean racial element dating back at least to the time of the Amorites.

FIG. 3 (3 views). The American-born (Massachusetts) son of a rabbi from Memel, and a mother born in Riga. This individual, despite his cephalic index of 81, is otherwise a good example of the straight-nosed Mediterranean type which is as numerous among the unmixed Jews as the convex-nosed variety.

FIG. 4 (3 views). An American Jew (New York) whose ancestors without exception have lived in the Rhinelands for several centuries and who probably first settled there in Roman times. Racially this individual is Nordic; he shows little or no physical evidence of Jewish ancestry.

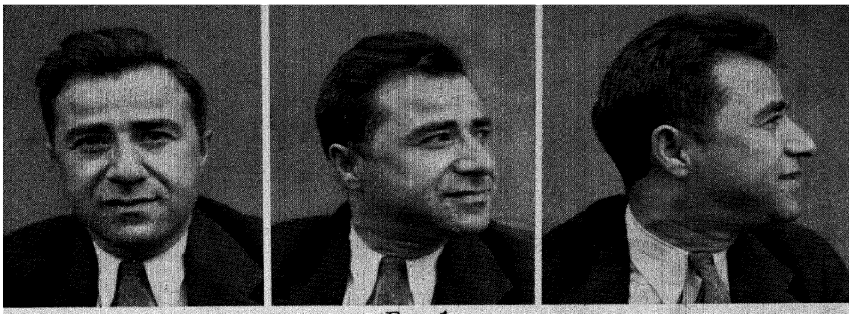


FIG. 1

FIG. 2

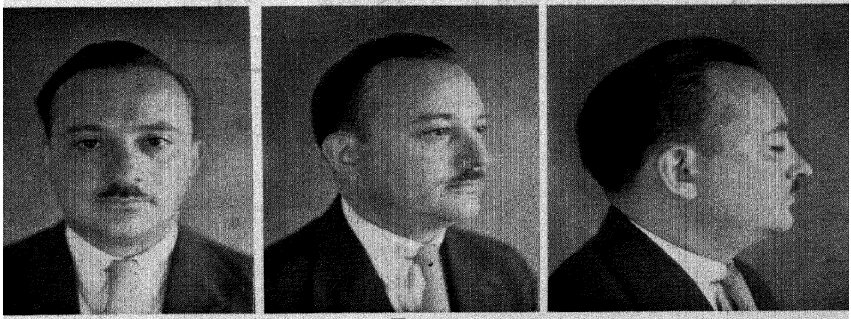


FIG. 3

FIG. 4

Plate 46

THE JEWS: III

FIG. 1 (2 views, photo C. W. Dupertuis). A tall, blond, dolichocephalic Jew from Illinois, whose parents were born in Russia. Metrically Nordic, only the morphology of the nasal tip suggests non-Nordic ancestry. Like many American Jews, this young man has not acquired the "Jewish" facial expression more common among the generation born in Europe.

FIG. 2 (2 views, photo C. W. Dupertuis). An extremely tall, large-headed Jew, also from Illinois, whose father was born in Poland and whose mother was American born. Brunet, brachycephalic, and morphologically within the Jewish range, this individual does not look Jewish in the popular sense for the same reason as in the case of the Nordic Jew shown above.

FIG. 3 (2 views). A Jew from New Jersey, parents from Lithuania and Russia; metrically and morphologically close to the Ashkenazic mean; a central Jewish type.

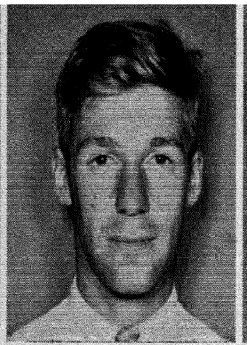
FIG. 4 (2 views). A Jew from Illinois, both parents from Russia. Although metrically mesocephalic, this individual is morphologically close to the prototype of the Alpine element acquired by the Jews in western Europe before their march eastward.

FIG. 5 (1 view). A Massachusetts Jew of Lithuanian Jewish parentage. Racially he is completely Alpine.

FIG. 6 (1 view). A central Asiatic Jew, from Bokhara; a member of an ancient and isolated Jewish colony. This individual shows unmistakable Alpine characters, no doubt acquired from early Tajik admixture. Few if any of the Bokharan Jews are mongoloid.

FIG. 7 (2 views). Another Bokharan Jew, clearly Dinaricized. The old Mediterranean Jewish element in central Asia has been altered by Alpine accretion. Yet the Bokharan Jews, if appropriately dressed, could easily pass in most cases for central European Jews, which shows not only the extraordinary racial continuity of the Jews in widely separated regions, but also their tendency to mix with similar elements in different places. All or nearly all racial types found among whites anywhere may be isolated among the Jews; the majority, however, preserve some inheritable physical evidence of their Palestinian origin.

FIG. 1



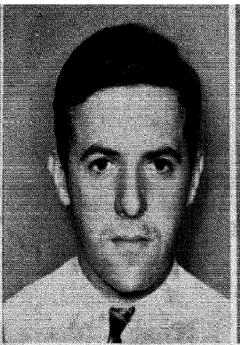


FIG. 2

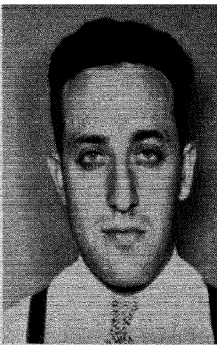


FIG. 3

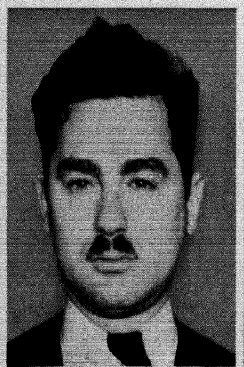


FIG. 4

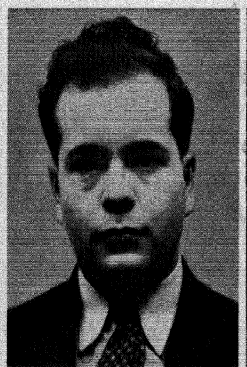


FIG. 5

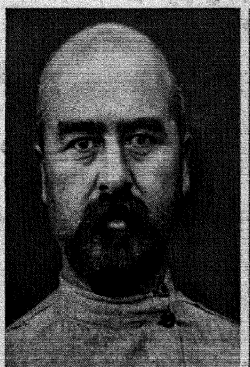


FIG. 6

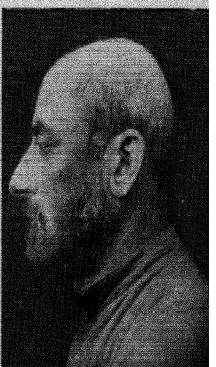


FIG. 7

TABLES ACCOMPANYING PHOTOGRAPHIC SUPPLEMENT

These tables give the principal anthropometric specifications of most of the subjects shown in the preceding plates. In a few instances, especially when photographs taken from outside sources have been used, such data are unavailable. Stature is in centimeters, weight in pounds, and head and face measurements in millimeters. In the eye color, the use of plus signs (++, +++) over one of the component elements in a mixed iris indicates the relative importance of the elements in the eye in question. Thus $\overset{+++}{\text{Blue-Brown}}$ indicates an iris which is almost entirely blue; $\overset{++}{\text{Green-Brown}}$ one which is visibly more brown than green.

	Plate 2	Plate 3 [1]
	Fig. 1	Fig. 3
Age	61	
Stature	175 cm.	159 cm.
Weight	165 lbs.	
Head L.	192 mm.	187 mm.
Head Br.	167	151
Min. Fr.	118	
Bizyg.	148	154
Bigon.	122	
T. F. Ht.	130	127
U. F. Ht.	83	
N. Ht.	61	55
N. Br.	38	36
Biorb.	94	
Interorb.	41	
C. I.	87.0	80.8
F. I.	87.8	82.5
U. F. I.	56.1	
N. I.	62.3	65.5
Skin		#11
Hair	Light-Brown	#4 Dark-Brown
Beard		
Eyes	Blue (yellow spot)	#6 Light-Brown

[1] The sign #, used in reference with skin color, refers to the numbers on the standard von Luschan Hautfarbentafel (Skin Color Chart); when used with hair color, to the standard Fischer Haarfarbentafel (Hair Color Chart).

Plate 4

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	51	47	44	49
Stature	181 cm.	175 cm.	180 cm.	180 cm.
Weight	204 lbs.	213 lbs.		202 lbs.
Head L.	212 mm.	207 mm.	208 mm.	212 mm.
Head Br.	152	154	151	160
Min. Fr.	114	108	108	118
Bizyg.	150	150	141	148
Bigon.	130	120	103	111
T. F. Ht.	134	134	134	146
U. F. Ht.	80	78		87
N. Ht.	60	65	56	65
N. Br.	43	48	34	39
Biorb.	108	96		94
Interorb.	40	34		41
C. I.	71.2	74.4	72.5	75.5
F. I.	89	87	95	99
U. F. I.	53	52		60
N. I.	72	74	60.5	60
Skin				
Hair	#8 Brown	#5 Dk.-Br.	#25 Ash-Blond	#13 Golden
Beard			+++	
Eyes	Blue	Green-Br.	#14 Blue-Br.	Blue

Plate 5

	Fig. 1	Fig. 2	Fig. 3	Fig. 5
Age	58	54		30
Stature	184 cm.	179 cm.	177 cm.	172 cm.
Weight	210 lbs.	200 lbs.		190 lbs.
Head L.	210 mm.	197 mm.	199 mm.	191 mm.
Head Br.	169	166	158	165
Min. Fr.	128	114		110
Bizyg.	155	148	147	157
Bigon.	121	123	109	127
T. F. Ht.	128	132	118	123
U. F. Ht.	75	80		73
N. Ht.	62	65		54
N. Br.	45	36		38
Biorb.	106	94		102
Interorb.	44	32		36
C. I.	80.5	84.3	79.4	86.4
F. I.	82.6	89.2	80.2	78.3
U. F. I.	49	54.1		53.8
N. I.	72.6	55.4		70.4
Skin				
Hair	Golden	#12 Golden	#25 Ash-Blond	#13 Golden
Beard	+++			+++
Eyes	Blue-Br.	Blue	#11 Blue-Br.	Blue-Br.

Plate 6

	Fig. 2	Fig. 3	Fig. 4	Fig. 5
Age	33	31	55	54
Stature	172 cm.	177 cm.	167 cm.	178 cm.
Weight	154 lbs.	166 lbs.	210 lbs.	190 lbs.
Head L.	203 mm.	203 mm.	204 mm.	201 mm.
Head Br.	175	166	166	165
Min. Fr.	119	117	115	112
Bizyg.	158	151	153	154
Bigon.	108	123	121	120
T. F. Ht.	120	123	141	128
U. F. Ht.	64	75	78	71
N. Ht.	54	55	62	55
N. Br.	37	38	46	45
Biorb.		103	97	103
Interorb.		37	35	43
C. I.	86	81.8	81.4	82.1
F. I.	76	81.5	92.2	83.1
U. F. I.	40	49.7	51.0	46.1
N. I.	68	69.1	74.2	81.8
Skin				
Hair	Light-Br.	#9 Reddish-Br.	Golden	Black
Beard	+++	++		++
Eyes	Blue-Br.	Green-Br.	Blue	Green-Br.

Plate 7

	Fig. 3	Fig. 4	Fig. 5
Age	40	54	57
Stature	164 cm.	162 cm.	167 cm.
Weight	140 lbs.	175 lbs.	158 lbs.
Head L.	200 mm.	181 mm.	188 mm.
Head Br.	162	154	154
Min. Fr.	119	108	109
Bizyg.	148	144	143
Bigon.	104	124	111
T. F. Ht.	124	121	129
U. F. Ht.	69	74	80
N. Ht.	51	54	59
N. Br.	33	38	38
Biorb.	98	87	85
Interorb.	37	32	35
C. I.	81.0	85	81.9
F. I.	83.8	84	90.2
U. F. I.	46.6	51.4	55.9
N. I.	64.7	70.4	64.4
Skin			
Hair	#7 Brown	#5 Dk.-Brown	Golden
Beard		+++	
Eyes	Blue	Blue-Br.	Blue

Plate 8

	Fig. 1	Fig. 2	Fig 4	Fig. 5
Age	49	45	22	48
Stature	182 cm.	184 cm.	171 cm.	190 cm.
Weight	180 lbs.	196 lbs.		
Head L.	184 mm.	195 mm.	191 mm.	186 mm.
Head Br.	162	164	156	165
Min. Fr.	107	118	111	112
Bizyg.	144	151	143	146
Bigon.	112	124	111	115
T. F. Ht.	134	134	114	114
U. F. Ht.	77	78	71	67
N. Ht.	55	66	53	52
N. Br.	39	35	35	35
Biorb.	87	96		
Interorb.	32	33		
C. I.	88.0	83.7	82	90
F. I.	93.0	88.7	80	78
U. F. I.	53.5	51.7	50	46
N. I.	70.9	53.0	66	67
Skin				
Hair	Light-Br.	Black	Light-Br.	Golden
Beard	++		++	++
Eyes	Blue-Br.	Brown	Green-Br.	Green-Br.

Plate 9

	Fig. 1	Fig. 2	Fig 3	Fig. 4	Fig 5	Fig. 6	Fig. 7
Age	38	37	50	30	30	19	27
Stature	167 cm.	180 cm.	174 cm.	170 cm.	180 cm.	169 cm.	182 cm.
Weight	205 lbs.	225 lbs.	193 lbs.	160 lbs.	168 lbs.	142 lbs.	165 lbs.
Head L.	201 mm.	202 mm.	199 mm.	196 mm.	194 mm.	184 mm.	194 mm.
Head Br.	157	162	162	153	153	143	156
Min. Fr.	114	112	111	106	105	104	107
Bizyg.	149	156	147	135	143	139	140
Bigon.	115	132	114	103	106	107	102
T. F. Ht.	127	138	126	132	122	129	128
U. F. Ht.	72	78	72	73	69	62	75
N. Ht.	56	58	56	52	53	46	58
N. Br.	39	35	35	36	36	36	36
Biorb.	94				92		97
Interorb.	34				34		37
C. I.	78.1	80	81	78	78.9	78	80.4
F. I.	85	88	86	98	85.3	93	91
U. F. I.	52	50	49	54	48.3	45	54
N. I.	70	60	63	69	67.9	78	62
Skin							
Hair	Golden	Red	Red-Br.	Red	#8 Med.-Br.	Dark-Br.	Dark-Br.
Beard			Red				
Eyes	Blue	Blue	++ Blue-Br.	Blue	+++ Green-Br.	+++ Blue-Br.	+++ Blue-Br.

Plate 10

	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 6	Fig. 7
Age	33	37	45	18	31	50	Senile
Stature	166 cm.	177 cm.	168 cm.	168 cm.	163 cm.	166 cm.	171 cm.
Weight							
Head L.	193 mm.	201 mm.	192 mm.	182 mm.	194 mm.	198 mm.	194 mm.
Head Br.	150	159	145	141	149	141	143
Min. Fr.	107	110	101	106	105	108	104
Bizyg.	140	146	138	133	136	137	136
Bigon.	110	107	114	105	97	106	96
T. F. Ht.	133	117	132	124	108	114	125
U. F. Ht.	79	68	78	70	60	67	72
N. Ht.	58	52	54	51	44	46	49
N. Br.	38	36	38	35	37	37	35
Biorb.							
Interorb.							
C. I.	77.7	79.1	75.5	77.5	76.8	71.2	73.7
F. I.	95	80	96	93	79.4	83	92
U. F. I.	56	47	56.5	53	43.8	49	53
N. I.	66	69	70	69	84.1	80	71
Skin	#3	#10	#3	Very Light		Vas. Lt. White	#13
Hair	+++ Light-Br.	Brown	Red-Br.	Ash-Blond	Dark-Br.	Brown	Black
Beard		Light-Br.			Red-Br.	Red-Br.	
Eyes	+++ Blue-Br.	Light-Br.	Blue-Br.	+++ Blue-Br.	Dark-Br.	+ Green-Br.	++ Gray-Br.

Plate 11

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	48	36	34	37
Stature	162 cm.	182 cm.	170 cm.	172 cm.
Weight	154 lbs.	235 lbs.	174 lbs.	181 lbs.
Head L.	186 mm.	188 mm.	188 mm.	189 mm.
Head Br.	159	158	169	153
Min. Fr.	104	111	111	108
Bizyg.	134	144	151	143
Bigon.	111	119	111	110
T. F. Ht.	124	125	127	124
U. F. Ht.	71	68	75	75
N. Ht.	50	53	60	55
N. Br.	32	34	39	34
Biorb.	91	94	98	89
Interorb.	31	33	37	28
C. I.	85.5	84.0	89.9	81
F. I.	93	86.8	84	87
U. F. I.	53	47.2	50	52
N. I.	64	64.2	65	65
Skin	++			
Hair	Dark-Br.	Dark-Br.	Dark-Br.	#5 Med.-Br.
Beard	++++	+++	++	+++
Eyes	Green-Br.	Blue-Br.	Green-Br.	Blue-Br.

Plate 12

	Fig 1	Fig. 2	Fig. 3	Fig. 4
Age	44	41	46	54
Stature	173 cm.	163 cm.	167 cm.	159 cm.
Weight	190 lbs.	138 lbs.	160 lbs.	140 lbs.
Head L.	192 mm.	190 mm.	188 mm.	193 mm.
Head Br.	154	161	161	158
Min. Fr.	106	106	112	110
Bizyg.	138	140	146	137
Bigon.	118	114	100	101
T. F. Ht.	120	115	127	124
U. F. Ht.	78	72	74	70
N. Ht.	59	60	63	54
N. Br.	37	37	38	35
Biorb.	90	87	91	91
Interorb.	29	33	34	31
C. I.	80.2	89.9	85.6	81.9
F. I.	87	82.1	87	90.5
U. F. I.	56.5	51.4	50.7	51.4
N. I.	62.7	61.7	60.3	64.8
Skin				
Hair	#8 Med.-Br.	Dark-Br.	Black	Med.-Br.
Beard				++
Eyes	Blue	Green-Br.	Dark-Br.	Blue-Br.

Plate 13

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	42	42	57	56
Stature	169 cm.	170 cm.	168 cm.	166 cm.
Weight	155 lbs.	175 lbs.	175 lbs.	170 lbs.
Head L.	187 mm.	190 mm.	195 mm.	194 mm.
Head Br.	156	165	167	158
Min. Fr.	114	110	116	108
Bizyg.	147	150	152	148
Bigon.	107	117	112	114
T. F. Ht.	133	130	121	126
U. F. Ht.	76	76	66	77
N. Ht.	58	63	53	60
N. Br.	34	36	38	35
Biorb.	87	96	94	91
Interorb.	30	34	33	38
C. I.	83.4	86.8	85.6	81.4
F. I.	90.5	86.7	79.6	85.1
U. F. I.	51.7	50.7	43.4	52
N. I.	58.6	57.1	71.7	58.3
Skin				
Hair	Dark-Brown	Med.-Br.	Dk.-Brown	Black
Beard		++	+++	
Eyes	Blue	Green-Br.	Blue-Brown	Dk.-Brown

Plate 14

	Fig 1	Fig 2	Fig. 3	Fig 4	Fig. 5
Age	51	41		60	50
Stature	178 cm.	172 cm.	165 cm.	172 cm.	177 cm.
Weight	179 lbs.	195 lbs.		215 lbs.	195 lbs.
Head L.	188 mm.	193 mm.	177 mm.	190 mm.	197 mm.
Head Br.	163	158	162	164	163
Min. Fr.	109	103	109	114	113
Bizyg.	146	144	146	148	155
Bigon.	114	112	109	126	122
T. F. Ht.	123	128	121	131	130
U. F. Ht.	70	71	69	72	77
N. Ht.	58	56	54	54	58
N. Br.	34	37	37	39	38
Biorb.	90	87		98	100
Interorb.	33	29		36	30
C. I.	86.7	81 9	91.5	86.3	82.7
F. I.	84	88.9	82 9	88.5	83.9
U. F. I.	48	49.3	47.3	48	49.7
N. I.	59	66.1	68.5	72.2	65.5
Skin			#3 Pink-White		
Hair	Dark-Br.	#4 Dk.-Br.	#9 Med.-Br.	Black	Dark-Br.
Beard	Reddish		#10 Red-Br		
Eyes	Bl.-Gr.-Br.	Green-Br.	Gray-Br.	Light-Br.	Green-Br.

Plate 15

	Fig. 1	Fig. 2	Fig. 3
Age	33	43	46
Stature	173 cm.	164 cm.	172 cm.
Weight	207 lbs.	175 lbs.	152 lbs.
Head L.	183 mm.	189 mm.	191 mm.
Head Br.	160	166	163
Min. Fr.	111	115	116
Bizyg.	143	153	150
Bigon.	113	120	117
T. F. Ht.	133	121	127
U. F. Ht.	76	65	74
N. Ht.	58	51	59
N. Br.	36	36	40
Biorb.	91	100	92
Interorb.	35	36	35
C. I.	87.4	87.8	85.3
F. I.	93	79	84.7
U. F. I.	53.1	42.5	49.7
N. I.	62.1	70.6	67.8
Skin			
Hair	Dark-Brown	Med.-Brown	Med.-Brown
Beard			++
Eyes	Med.-Brown	Blue	Gray-Brown

Plate 16

	Fig. 1	Fig. 2	Fig. 3	Fig. 6
Age	18	30	36	21
Stature	169 cm.	163 cm.	166.7 cm.	180 cm.
Weight				
Head L.	183 mm.	202 mm.	195 mm.	180 mm.
Head Br.	143	142	147	135
Min. Fr.	100	103	111	
Bizyg.	129	132	136	128
Bigon.	101	100	109	111
T. F. Ht.	125	128	131	123
U. F. Ht.	77	79	75	77
N. Ht.	59	58	58	60
N. Br.	31	36	33	37
Biorb.	83	83	91	
Interorb.	30	31	31	
C. I.	78	70	75	75
F. I.	97	97	96	96
U. F. I.	60	60	55	60
N. I.	52	62	57	62
Skin	#10	#10	#10	
Hair	Black	++ Dark-Brown	Black	
Beard		+++		
Eyes	Dark-Brown	Gray-Brown	Light-Br.	Dark-Br.

	Plate 17			Plate 18
	Fig. 1	Fig. 2	Fig. 3	Fig. 7
Age	43	48	42	48
Stature	169 cm.	167 cm.	176 cm.	174 cm.
Weight	192 lbs.	144 lbs.	130 lbs.	
Head L.	201 mm.	188 mm.	197 mm.	
Head Br.	148	151	153	
Min. Fr.	106	109	113	
Bizyg.	142	143	144	
Bigon.	112	113	110	
T. F. Ht.	125	141	132	
U. F. Ht.	81	83	77	
N. Ht.	67	69	61	
N. Br.	37	35	38	
Biorb.	91	90	96	
Interorb.	31	31	33	
C. I.	73.6	80.3	77.7	70
F. I.	88	98.6	91.7	92
U. F. I.	57	58.0	53.5	
N. I.	55.2	51.5	62.3	52
Skin				
Hair	Black	Dark-Br.	Black	Black
Beard				Black & Red
Eyes	Dark-Br.	Green-Br.	Dark-Br.	#8 Black-Br.

	Plate 19				
	Fig. 1	Fig. 2	Fig. 3	Fig 4	Fig 5
Age	39		20	26	26
Stature	166 cm.	167 cm.	157.8 cm.	153. 3 cm.	158.2 cm.
Weight					
Head L.	187 mm.		181 mm.	191 mm.	187 mm.
Head Br.	150		142	153	147
Min. Fr.			101	103	108
Bizyg.	140		127	121	129
Bigon.	100			86	97
T. F. Ht.	115		131	117	120
U. F. Ht.	62		77	68	71
N. Ht.	52		56	48	59
N. Br.	32		37	79	35
Biorb.			92	93	91
Interorb.			34	29	33
C. I.	80.2		78	80	83
F. I.	82		103	97	79
U. F. I.	50.4		61	55	55
N. I.	61.5		66	75	69
Skin		Br. Sallow	#15	#10–#22	#10
Hair		Coarse Bl.	Black	Dark-Br.	Black
Beard					+++
Eyes		Dark-Br.	Dark-Br.	Dark-Br.	Gr.-Br.

Plate 20

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	42	50	39	28
Stature	171 cm.	152 cm.	181 cm.	168 cm.
Weight		102 lbs.	130 lbs.	130 lbs.
Head L.	192 mm.	196 mm.	194 mm.	188 mm.
Head Br.	136	154	151	148
Min. Fr.	104	109	107	100
Bizyg.	127	134	129	134
Bigon.	101	102	101	103
T. F. Ht.	130	115	119	125
U. F. Ht.	73	70	71	73
N. Ht.	61	60	54	53
N. Br.	37	35	31	36
Biorb.	91	87	93	91
Interorb.	31	32	35	33
C. I.	71	78.6	78	79
F. I.	102	86	92	93
U. F. I.	57	52	55	54
N. I.	61	58	57	68
Skin	#29	#23	#18	#22
Hair	Black		Black	
Beard				
Eyes	Dark-Br.	Dark-Lt.-Br.	Light-Br.	Dark-Br.

Plate 21

	Fig. 2	Fig. 4	Fig. 5	Fig. 6
Age	34	26		28
Stature	183 cm.	171 cm.	160 cm.	167.4 cm.
Weight		137 lbs.	133 lbs.	
Head L.	197 mm.	188 mm.	182 mm.	189 mm.
Head Br.	146	144	137	142
Min. Fr.			105	103
Bizyg.	134	132	127	137
Bigon.		103	95	112
T. F. Ht.	119	129	122	126
U. F. Ht.		75	75	80
N. Ht.	59	56	55	59
N. Br.	30	37	32	36
Biorb.				
Interorb.				
C. I.	74.1	76.6	75.3	75.1
F. I.	89	98	96.1	92
U. F. I.		57	59.1	58
N. I.	51	66	58.2	61
Skin	#15–#17		#7	
Hair	Black	Dark-Br.	Black	Black
Beard				Black
Eyes	#4	Light-Br.	Dark-Br.	Light-Br.

Plate 22

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	38	17	32	24
Stature	162 cm.	159 cm.	167 cm.	168 cm.
Weight	140 lbs.	120 lbs.	138 lbs.	140 lbs.
Head L.	190 mm.	187 mm.	193 mm.	196 mm.
Head Br.	150	142	149	156
Min. Fr.	106	106	111	106
Bizyg.	132	128	134	141
Bigon.	99	102	99	103
T. F. Ht.	120	125	114	132
U. F. Ht.	74	73	69	76
N. Ht.	57	56	56	53
N. Br.	35	35	37	35
Biorb.	90	96	89	98
Interorb.	33	34	35	36
C. I.	79	75.9	77.2	79.6
F. I.	90.9	97.7	85.1	93.6
U. F. I.	52.6	57	51.5	53.9
N. I.	61.4	64.3	66.1	66
Skin				
Hair	Black	Dark-Br.	Black	Black
Beard				
Eyes	Light-Br.	Blue	Dark-Br.	Light-Br.

Plate 23

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	21	41	24	24
Stature	175 cm.	172 cm.	178 cm.	169 cm.
Weight	142 lbs.	158 lbs.	150 lbs.	141 lbs.
Head L.	199 mm.	192 mm.	203 mm.	200 mm.
Head Br.	151	149	150	154
Min. Fr.	106	109	106	104
Bizyg.	142	133	136	134
Bigon.	108	101	101	102
T. F. Ht.	127	130	125	119
U. F. Ht.	73	75	75	75
N. Ht.	58	60	56	61
N. Br.	35	29	36	34
Biorb.	94	92	94	86
Interorb.	36	30	36	27
C. I.	75.9	77.6	73.9	77
F. I.	89.4	97.7	91.9	88.8
U. F. I.	51.4	56.4	55.1	56
N. I.	60.3	48.3	64.3	55.7
Skin				
Hair	#6	Dark-Br.	Black	#5
Beard		+++		
Eyes	Green-Br.	Green-Br.	Dark-Br.	Blue

Plate 24

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	42	37	35	47
Stature	170 cm.	170 cm.	170 cm.	174 cm.
Weight	190 lbs.	140 lbs.	156 lbs.	168 lbs.
Head L.	204 mm.	203 mm.	206 mm.	207 mm.
Head Br.	156	152	163	150
Min. Fr.	118	108	107	113
Bizyg.	148	130	138	142
Bigon.	120	108	103	115
T. F. Ht.	132	121	123	124
U. F. Ht.	78	69	74	77
N. Ht.	63	56	60	63
N. Br.	35	33	32	33
Biorb.	94	90	94	94
Interorb.	33	30	33	36
C. I.	76.5	74.9	79.1	72.5
F. I.	89.2	93.1	89.1	87
U. F. I.	52.7	53.1	53.6	51
N. I.	55.6	58.9	53.3	52
Skin				
Hair	#4 Dark-Br.	Dark-Br.	Black	Dark-Br.
Beard			Red	
	++		++	+++
Eyes	Blue-Br.	Blue	Blue-Br.	Blue-Br.

Plate 25

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	61	36	31	51
Stature	167 cm.	170 cm.	172 cm.	169 cm.
Weight	135 lbs.	110 lbs.	170 lbs.	140 lbs.
Head L.	195 mm.	193 mm.	201 mm.	194 mm.
Head Br.	151	148	153	144
Min. Fr.	104	103	104	107
Bizyg.	134	125	144	128
Bigon.	98	94	107	94
T. F. Ht.	125	120	119	120
U. F. Ht.	79	72	66	70
N. Ht.	65	56	54	54
N. Br.	30	31	37	37
Biorb.	86	86	90	89
Interorb.	31	29	33	31
C. I.	77.4	76.7	76.1	74.2
F. I.	93.3	96	82.6	93.8
U. F. I.	59	57.6	45.8	54.7
N. I.	46.2	55.4	68.5	68.5
Skin				
Hair	Dark-Br.	Dark-Br.	Dark-Br.	#5 Dark-Br.
Beard	++		++	
Eyes	Blue-Br.	Light-Br.	Green-Br.	Light-Br.

Plate 26

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	31	47	28	33
Stature	167 cm.	167.4 cm.	176 cm.	174 cm.
Weight	148 lbs.		141 lbs.	175 lbs.
Head L.	181 mm.	199 mm.	199 mm.	197 mm.
Head Br.	142	153	158	154
Min. Fr.	107		106	112
Bizyg.	132	139	148	142
Bigon.	104	102	112	114
T. F. Ht.	127	125	126	116
U. F. Ht.	73		76	69
N. Ht.	55		60	56
N. Br.	31		34	37
Biorb.	90		90	99
Interorb.	32		36	36
C. I.	78.4	76 9	79.4	78.2
F. I.	96.2	89.9	85.1	81.7
U. F. I.	55.3		51.3	48.6
N. I.	56.4	51.7	56.7	66.1
Skin				
Hair	Black	#4 Dark-Br.	Dark-Br.	Black
Beard				++
Eyes	Dark-Br.	#6 Green-Br.	Dark-Br.	Green-Br.

Plate 27

	Fig. 1	Fig. 2	Fig 3	Fig. 4
Age	24	37	28	34
Stature	170 cm.	175 cm.	181 cm.	182 cm.
Weight	165 lbs.	165 lbs.	160 lbs.	170 lbs.
Head L.	204 mm.	204 mm.	200 mm.	215 mm.
Head Br.	143	150	152	150
Min. Fr.	103	103	106	110
Bizyg.	137	134	137	135
Bigon.	104	104	96	108
T. F. Ht.	130	128	140	121
U. F. Ht.	77	72	84	73
N. Ht.	63	53	61	60
N. Br.	35	36	36	33
Biorb.	95	89	95	89
Interorb.	32	31	30	32
C. I.	70.1	73.5	76	70
F. I.	95	95.5	102	90
U. F. I.	56	53.7	61	60
N. I.	56	67.9	59	55
Skin				
Hair	Golden	Light-Br.	Golden	Ash-Blond
Beard				+++
Eyes	Gray-Blue	Blue	Blue	Blue-Br.

Plate 28

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	47	38	45	50
Stature	164 cm.	174 cm.	164 cm.	167 cm.
Weight	120 lbs.	153 lbs.	145 lbs.	169 lbs.
Head L.	188 mm.	191 mm.	188 mm.	188 mm.
Head Br.	148	149	152	159
Min. Fr.	98	107	109	118
Bizyg.	134	132	143	145
Bigon.	109	103	106	111
T. F. Ht.	110	118	118	117
U. F. Ht.	68	71	72	68
N. Ht.	55	54	55	54
N. Br.	37	34	34	30
Biorb.	91	89	100	87
Interorb.	28	29	37	36
C. I.	78.7	78	80.9	84.6
F. I.	82	89.4	82.5	80.7
U. F. I.	51	53.8	50.4	46.9
N. I.	67	63	61.8	55.6
Skin				
Hair	Dark-Br.	#5 Med.-Br.	#6 Red-Br.	#6 Med.-Br.
Beard	+++			+++
Eyes	Blue-Br.	Blue	Light-Br.	Blue-Br.

Plate 29

	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 6
Age			35	45	19	57
Stature	172 cm.	175 cm.	182 cm.	171 cm.	181 cm.	165 cm.
Weight			150 lbs.	148 lbs.		132 lbs.
Head L.	194 mm.		188 mm.	202 mm.	211 mm.	194 mm.
Head Br.	150		151	156	162	147
Min. Fr.			108	111	113	108
Bizyg.	138		137	142	145	138
Bigon.	105		107	106	111	116
T. F. Ht.	130		131	127	136	132
U. F. Ht.			77	72	78	76
N. Ht.			61	60	63	61
N. Br.			36	36	37	37
Biorb.			88			
Interorb.			26			
C. I.	77.3	73	80.3	77	77	76
F. I.	94.2		96	89	94	96
U. F. I.			56	51	54	55
N. I.			59	60	59	61
Skin						
Hair	#26 Ash-Bl.	Golden	#10 Light-Br.	Brown	Red	Dark-Br.
Beard						++
Eyes	#15 Gray-Bl.	Blue	Blue-Gray	Blue	Blue-Br.	Blue-Br.

Plate 30

	Fig. 1	Fig. 4	Fig. 5	Fig. 6
Age	48	17	32	24
Stature	172 cm.	178 cm.	175 cm.	165 cm.
Weight	190 lbs.	154 lbs.		115 lbs.
Head L.	195 mm.	210 mm.	195 mm.	188 mm.
Head Br.	151	148	147	146
Min. Fr.	108	103	107	
Bizyg.	138	138	133	128
Bigon.	104	101	104	99
T. F. Ht.	123	134	129	126
U. F. Ht.	67	79	76	78
N. Ht.	57	60	57	59
N. Br.	36	34	35	35
Biorb.	89	95		
Interorb.	30	31		
C. I.	77.4	70.5	75.4	77.7
F. I.	89	97	97	98.4
U. F. I.	54.5	57	57	60.9
N. I.	63	57	61	59.3
Skin			#3	#13
Hair	Light-Br.	#12 & #6	Golden	#6 Red-Br.
Beard			Golden	
Eyes	++ Blue-Br.	Green-Br.	+++ Blue-Br.	Gray-Br.

Plate 31

	Fig 1	Fig. 2	Fig 3	Fig. 4
Age	41	46	33	46
Stature	171 cm.	164 cm.	167 cm.	167 cm.
Weight	152 lbs.	150 lbs.	148 lbs.	152 lbs.
Head L.	187 mm.	184 mm.	173 mm.	189 mm.
Head Br.	162	161	162	161
Min. Fr.	109	113	100	113
Bizyg.	144	147	142	148
Bigon.	108	111	113	107
T. F. Ht.	126	123	115	125
U. F. Ht.	74	72	65	73
N. Ht.	56	55	52	56
N. Br.	34	36	32	35
Biorb.	93	85	78	99
Interorb.	30	31	27	37
C. I.	86.8	87.5	93.4	85.2
F. I.	88	84	81	84
U. F. I.	51	49	46	49
N. I.	61	65	62	62
Skin				
Hair	Lt.-Gold.-Br.	Lt.-Br.	Golden	Golden
Beard	+++	+++	+++	
Eyes	Blue-Br.	Blue-Br.	Blue-Br.	Blue

Plate 32

	Fig. 1	Fig 2	Fig. 3	Fig. 4
Age	30	50	26	31
Stature	167 cm.	172 cm.	177 cm.	178 cm.
Weight	140 lbs.	160 lbs.	172 lbs.	165 lbs.
Head L.	196 mm.	196 mm.	195 mm.	200 mm.
Head Br.	155	161	157	156
Min. Fr.	104	110	106	115
Bizyg.	138	142	140	143
Bigon.	102	116	112	111
T. F. Ht.	129	131	120	138
U. F. Ht.	74	77	68	77
N. Ht.	54	61	54	63
N. Br.	36	40	36	34
Biorb.	92	94	91	90
Interorb.	36	39	34	32
C. I.	79.1	82.1	80.5	78
F. I.	94	92	86	96
U. F. I.	54	54	56	54
N. I.	67	66	67	54
Skin				
Hair	Golden	#15 Golden	#4 Dk.-Br.	#7 Med.-Br.
Beard				++
Eyes	Blue	Blue	Blue	Blue-Br.

Plate 33

	Fig. 1	Fig. 2	Fig. 3	Fig 4
Age	68	34	26	22
Stature	172 cm.	182 cm.	180 cm.	172 cm.
Weight	207 lbs.	185 lbs.	188 lbs.	165 lbs.
Head L.	203 mm.	197 mm.	190 mm.	191 mm.
Head Br.	157	160	162	163
Min. Fr.	107	113	113	117
Bizyg.	148	152	140	144
Bigon.	109	120	110	114
T. F. Ht.	126	132	122	137
U. F. Ht.	75	72	73	74
N. Ht.	62	60	58	57
N. Br.	32	35	38	36
Biorb.	97	91	92	102
Interorb.	38	33	36	41
C. I.	77.3	81.2	85.3	85.3
F. I.	85	86.8	87.1	95.1
U. F. I.	51	47.4	52.1	51.4
N. I.	51.6	58.3	65.5	63.2
Skin				
Hair	#8 Med.-Br.	Golden	Golden	Red
Beard		+++		
Eyes	Blue	Blue-Br.	Blue	Blue

Plate 34

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	60	64	38	38
Stature	164 cm.	167 cm.	162 cm.	167 cm.
Weight	156 lbs.	160 lbs.	130 lbs.	130 lbs.
Head L.	200 mm.	193 mm.	192 mm.	190 mm.
Head Br.	164	161	154	163
Min. Fr.	116	103	109	104
Bizyg.	145	146	136	138
Bigon.	117	112	113	104
T. F. Ht.	128	118	127	129
U. F. Ht.	75	72	76	76
N. Ht.	56	60	57	59
N. Br.	31	38	34	33
Biorb.	92	87	88	87
Interorb.	33	34	32	32
C. I.	82	83.4	80.2	85.8
F. I.	88.3	81	93.4	93.5
U. F. I.	51.7	50	57.4	55.1
N. I.	55.4	63	59.7	55.9
Skin				
Hair	#4 Dk.-Br.	#7 Med.-Br.	#10 Lt.-Br.	#10 Lt.-Br.
Beard			+++	
Eyes	Blue	Blue	Blue-Br.	Blue

Plate 35

	Fig 1	Fig 2	Fig. 3
Age	36	33	44
Stature	180 cm.	172 cm.	180 cm.
Weight	166 lbs.	149 lbs.	168 lbs.
Head L.	198 mm.	187 mm.	182 mm.
Head Br.	168	154	154
Min. Fr.	114	111	110
Bizyg.	138	138	137
Bigon.	106	104	110
T. F. Ht.	141	125	123
U. F. Ht.	82	74	74
N. Ht.	65	64	53
N. Br.	34	33	34
Biorb.	96	96	91
Interorb.	33	32	32
C. I.	84.9	82.4	84.6
F. I.	102.2	90.6	89.8
U. F. I.	59.4	53.6	54
N. I.	52.3	51.6	64.2
Skin			
Hair	#7 Med.-Br.	#7 Med.-Br.	#8 Brown
Beard	+++	+++	
Eyes	Blue-Br.	Blue-Br.	Blue

Plate 36

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	35	32	38	50
Stature	179 cm.	165 cm.	171 cm.	172 cm.
Weight	140 lbs.	180 lbs.	150 lbs.	152 lbs.
Head L.	193 mm.	189 mm.	183 mm.	190 mm.
Head Br.	161	154	160	154
Min. Fr.	103	109	110	111
Bizyg.	137	142	151	148
Bigon.	111	113	114	108
T. F. Ht.	123	120	123	122
U. F. Ht.	73	73	73	69
N. Ht.	60	61	59	53
N. Br.	32	35	36	32
Biorb.	94	94	96	90
Interorb.	32	36	33	36
C. I.	83.4	81.5	87.4	81
F. I.	89.8	84.5	81.5	82.4
U. F. I.	52.6	54.9	96.7	46.6
N. I.	53.3	57.4	61	60.4
Skin				
Hair	Red	#4 Dk.-Br.	Med.-Br.	#5 Dk.-Br.
Beard			++	
Eyes	Lt.-Br.	Blue	Green-Br.	Green-Br.

Plate 37

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	28	23	69	53
Stature	170 cm.	164 cm.	169 cm.	162 cm.
Weight	155 lbs.	180 lbs.	175 lbs.	149 lbs.
Head L.	181 mm.	195 mm.	189 mm.	189 mm.
Head Br.	159	166	162	162
Min. Fr.	111	106	108	104
Bizyg.	140	146	143	141
Bigon.	113	104	112	110
T. F. Ht.	134	124	129	118
U. F. Ht.	77	77	76	69
N. Ht.	63	60	58	61
N. Br.	37	36	37	34
Biorb.	89	92	89	92
Interorb.	29	36	37	33
C. I.	87.9	85.1	85.7	85.7
F. I.	96.4	84.9	90.2	83.7
U. F. I.	55	52.7	53.1	48.9
N. I.	58.7	60	63.8	55.7
Skin				
Hair	#4 Dk.-Br.	#4 Dk.-Br.	Med.-Br.	Dk.-Br.
Beard	++	++	+++	+++
Eyes	Green-Br.	Green-Br.	Blue-Br.	Blue-Br.

Plate 38

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Age	38	27	42	48
Stature	171 cm.	165 cm.	180 cm.	172 cm.
Weight	165 lbs.		175 lbs.	152 lbs.
Head L.	185 mm.	164 mm.	179 mm.	188 mm.
Head Br.	165	155	158	162
Min. Fr.	114		114	103
Bizyg.	143	148	146	147
Bigon.	120	99	110	113
T. F. Ht.	123	124	133	120
U. F. Ht.	77		76	75
N. Ht.	60		63	61
N. Br.	34		37	40
Biorb.	94		91	92
Interorb.	33		34	36
C. I.	89.2	93.9	88.3	86.2
F. I.	86	83.9	91.1	81.6
U. F. I.	53.8		52	51
N. I.	65	51.7	58.7	65.6
Skin				
Hair	Med.-Br.	#4–#5 Dk.-Br.	#5 Med.-Br.	Black
Beard			+++	
Eyes	Blue	#5–#6 Lt.-Br.	Blue-Br.	Lt.-Br.

Plate 39

	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig 5	Fig. 6
Age	33	25	45	43	42	40
Stature	180 cm.	169 cm.	181 cm.	170 cm.	168 cm.	164 cm.
Weight						185 lbs.
Head L.	179 mm.	187 mm.	178 mm.	182 mm.	190 mm.	191 mm.
Head Br.	157	165	160	158	171	162
Min. Fr.		111	109	107	106	117
Bizyg.	141	146	145	141	149	144
Bigon.		107	112	108	117	110
T. F. Ht.	120	124	132	130	126	137
U. F. Ht.		75	82	77	74	77
N. Ht.	53	58	67	60	56	62
N. Br.	34	36	34	34	37	39
Biorb.						95
Interorb.						38
C. I.	87.7	88	89.9	87	90	84.8
F. I.	85.1	85	91	92	85	95.1
U. F. I.		51	56.6	55	50	53.5
N. I.	64.2	62	50.8	57	66	62.9
Skin	#3					
Hair	Dk.-Br.	Dk.-Br.	Dk.-Br.	Lt.-Br.	Black	Black
Beard	Dk.-Br.	Lt.-Br.	Red-Br.	Golden	Red-Br.	
Eyes	Gray-Br.	Green-Br.	+++ Blue-Br.	Blue	+++ Green-Br.	Dk.-Br.

Plate 40

	Fig 1	Fig. 2	Fig. 3	Fig. 4
Age	48	46	44	25
Stature	159 cm.	164 cm.	178 cm.	170 cm.
Weight	131 lbs.	146 lbs.	186 lbs.	144 lbs.
Head L.	174 mm.	173 mm.	186 mm.	187 mm.
Head Br.	158	158	152	161
Min. Fr.	99	104	113	111
Bizyg.	143	143	141	139
Bigon.	102	113	103	108
T. F. Ht.	126	128	122	128
U. F. Ht.	78	78	77	75
N. Ht.	61	61	62	61
N. Br.	30	35	39	35
Biorb.	86	92	91	97
Interorb.	30	33	36	28
C. I.	90.8	91.3	81.7	86 1
F. I.	88.1	89.5	86.5	92
U. F. I.	54.5	54.5	54.6	54
N. I.	49.2	57.4	62.9	57.4
Skin				
Hair	Black	Black	Black	Dk.-Br.
Beard				
Eyes	Lt.-Br.	Green-Br.	Dk.-Br.	Med.-Br.

Plate 41

	Fig. 1	Fig 2	Fig. 3	Fig. 4
Age	47	55	39	43
Stature	167 cm.	167 cm.	172 cm.	167 cm.
Weight	172 lbs.	160 lbs.	162 lbs.	134 lbs.
Head L.	178 mm.	191 mm.	159 mm.	179 mm.
Head Br.	163	156	153	165
Min. Fr.	104	118	103	105
Bizyg.	140	143	134	131
Bigon.	113	118	113	100
T. F. Ht.	129	128	134	121
U. F. Ht.	76	72	81	74
N. Ht.	63	55	63	59
N. Br.	34	37	37	38
Biorb.	87	95	87	87
Interorb.	30	40	34	33
C. I.	91.6	81.7	96.2	92.2
F. I.	92.1	89.5	100	92.4
U. F. I.	54.3	49.7	60.5	56.6
N. I.	54	67.3	58.7	64.4
Skin				
Hair	Dk.-Br.	Black	Dk.-Br.	Black
Beard	++		+++	
Eyes	Green-Br.	Dk.-Br.	Blue-Br.	Med.-Br.

Chapter XI

THE MEDITERRANEAN WORLD

(1) INTRODUCTION

In the first two chapters of our survey of the living white peoples, we ıave covered the whole northern third of the European continent, and ıave discussed at some length the physical characteristics of the present rep-esentatives of the Nordic race, and of the East Baltic and Neo-Danubian acial types, as exemplified by the Finno-Ugrian peoples and by the peakers of the Baltic branch of Indo-European. We have, furthermore, tudied the survival and reëmergence in northwestern Europe of unre-luced, unmodified Upper Palaeolithic types, as exemplified especially by he Irish, and other British, and by the Scandinavians and East Baltic eoples. We have also discussed the incipiently mongoloid Lapps, and the nongoloid intrusions on European soil along its northern borders.

The next strip to follow, in a geographical sense, would be the whole ighland belt of central Europe stretching over to the Balkans, to Asia Minor, and across to the Caucasus and Turkestan. This second zone, owever, is one of immense racial complexity. In it various branches of he greater Mediterranean family, of Neolithic date and later, have been nodified by combining in various proportions with each other and with he autochthonous Alpine race. The key to the complexity of this zone es in the genetic action of this last entity, which is apparently a reduced, omewhat foetalized, or more highly evolved branch of the old Palaeo-thic stock than those which we have been studying in the north. Since, owever, it is the action of this element upon the Mediterranean family hich is important here, it will be easier to study this zone after having urveyed the population of a third belt, that occupied by the purest living epresentatives of the Mediterranean race.

This third racial zone stretches from Spain across the Straits of Gibraltar o Morocco, and thence along the southern Mediterranean shores into rabia, East Africa, Mesopotamia, and the Persian highlands; and across fghanistan into India. This zone is one of comparative racial simplicity. n it the brunet Mediterranean race lives today in its various regional rms without, in most cases, the complication of the Palaeolithic survivals nd reëmergences which have so confused the racial picture on the ground f Europe itself. Only in the mountains of Morocco and Algeria, and in ıe Canary Islands, is such a survival of any importance. The careful

study of living populations of the Mediterranean race in its early homelands will do much to simplify the task which lies ahead.

(2) THE MEDITERRANEAN RACE IN ARABIA

The Mediterranean racial zone stretches unbroken from Spain across the Straits of Gibraltar to Morocco, and thence eastward to India. A branch of it extends far southward on both sides of the Red Sea into southern Arabia, the Ethiopian highlands, and the Horn of Africa. Of the three main Mediterranean sub-races which this zone contains, the most widespread, the most central, the most highly evolved, and most characteristically Mediterranean is the central Mediterranean form, as best exemplified skeletally by the pre-dynastic Egyptians. Today the largest unified area in which this moderate-sized, intermediate Mediterranean racial type is found in greatest purity is the Arabian Peninsula.

Arabia, some fifteen hundred miles long by a thousand wide, possesses a huge land mass but a small population. Owing to the aridity of the great Ruba' el Khali desert and much of the north, the entire country can support no more than six million people, of whom at least a half live in the small, fertile, southwestern corner, the kingdom of Yemen.

The study of the prehistory of Arabia has hardly begun. It is, however, known that during the pluvial periods of the Pleistocene, the Empty Quarter was a fertile plateau, through which large streams carved wide and deep wadys; and that it has been inhabited by man from at least Acheulean times onward. With the post-glacial desiccation of this part of the world, Arabia may well have served as a *vagina gentium*, sending forth into other regions great numbers of inhabitants whom it could no longer support. In legendary and historic times this rôle has been continued; the early wanderings of the Jews, the settlement of the Ethiopian highlands by colonists from the Hadhramaut, the great expansion of the Arabs in early Moslem times, all serve as examples.

Modern Arabia is divided into several kingdoms each of which occupies a distinct geographical area. The largest, Saudi Arabia, includes the Nejd, Hasa, the Hejaz, and Asir; in other words, all of the regions north and immediately west of the Ruba' el Khali. The Nejd is occupied by a mixed population of pastoral nomads and agriculturists, of which the former are by far the more numerous. The Nejdis form a natural unit with the tribesmen of Transjordania and of the Syrian desert. The northern frontier of Arabia, in an ethnic sense, is not its present political boundary, but a line skirting the southern edge of the so-called Fertile Crescent. In northern Arabia should be included such tribes as the Ruwalla, the Shammar, and the Howeitat. The Hejaz, which includes the holy cities of Mekka and Medina, contains a sedentary population, which lives partly by agriculture

and partly by trade, while the wealth brought in by the annual hordes of pilgrims from the entire world of Islam helps, in large measure, to support the population of this sacred territory. Asir, the southernmost and most recently acquired section of Saudi Arabia, is a mountainous country occupied for the most part by farmers, and its ethnic relationships are with the Yemen, rather than with the north.

The kingdom of Yemen is bounded on the north by, roughly, the seventeenth parallel of north latitude; on the west by the Red Sea; on the south by the British Protectorate of Aden; and on the east by the southwesternmost extension of the Empty Quarter. It consists of two main parts, the narrow coastal plain and the plateau country which slopes gently eastward from a 10,000 foot escarpment. This plateau is extremely fertile and supports a large agricultural population. On its northern and eastern borders it tapers off gradually into pastoral country, and in the south merges into the ethnic unit of the Hadhramaut. The eastern part of this plateau was once an extremely populous region, since it was the seat of the three great kingdoms of Ma'an, Kataban, and Saba. This country was supported partly by agriculture, based on extensive irrigation projects, and partly by tolls from the incense caravans which passed through them on their way northward.

To the west of Yemen lies the Wady Hadhramaut, a narrow strip of fertile valley, separated from the Gulf of Aden by a forbidding mass of almost vegetation-free mountains. To the east of the Hadhramaut lies Dhofar, hemmed in by the Qara Mountains; and this small semi-circle of land preserves a lush vegetation made possible by the steady rainfall brought by the southeast monsoon. It, alone of all of southern Arabia, retains the Pleistocene climate which made this region, in former times, a land of great fertility. To the northeast of the great desert, which acts as a formidable barrier to separate these kingdoms, lies Oman, a mountainous country in which agriculture is practiced, and which is noted for its seafaring activities and for its export of dates.

The inhabitants of Arabia may be divided into two general groups: Arabs proper, and the aboriginal inhabitants of Hadhramaut, the Dhofar country, and the island of Socotra. Those who belong to the first category are almost without exception of Mediterranean race, and it is with this group that we are dealing in our search for a pure Mediterranean form. The Hadhramaut, on the other hand, contains a varied population with at least four social and ethnic elements.[1] These include the Bedawin, who live in the smaller side valleys and in the valleys between the Hadhramaut proper and the Gulf of Aden. They are slender, small-headed men, with ringlet hair, and facial features which relate them partly to the great Ved-

[1] Van den Berg, L. W. C., *Le Hadhramout et les Colonies Arabes dans l'Archipel Indien.*

doid group of humanity. Their affiliation to the white racial stock is of a borderline quality.

The second group is composed of tribesmen who inhabit the Hadhramaut valley proper, and who trace their ancestry to the Yemen and to other parts of Arabia. The ancestors of these tribesmen seem to have entered the Hadhramaut in pre-Islamic times. In addition to these early immigrants, there is a class of artisans who claim varied ancestry from different parts of the Arabic-speaking world, and, as an upper crust, a group of Sayyids, descendants of the Prophet, who form a priestly aristocracy. From the racial standpoint, the inhabitants of the Hadhramaut include both Veddoid and Mediterranean elements. In more recent times great numbers of slaves have been brought from Africa to increase this racial complexity.

In Mahra, Dhofar, and the island of Socotra, pre-Arabic Semitic languages survive. These are Mahri, spoken by the Mahra and the Socotrans, and Shahari, spoken by the people who live in the hills behind Dhofar.[2] Other early Semitic dialects seem to be affiliated with these two language groups. The Mahra and the people immediately behind Dhofar belong largely to the same general racial classification as the Hadhramaut Bedawin, and form a more exaggerated nucleus of the same physical type.

The origin of these non-Mediterranean, partly Veddoid people in southern Arabia is obscure. Culturally, they possess many primitive traits which would relate them, on the one hand, to the food-gathering economy of such people as the Australians and Veddas; and, on the other, to the cattle culture of the Todas in India and of the Hamites and Bantu in East Africa.

Let us first consider the racial characters of the plateau Yemenis, who seem to form the purest nucleus of the Mediterranean race in Arabia which has yet been studied.[3] A group of 400 adult males from the central plateau and from the adjacent escarpment region belongs, with few exceptions, to a homogeneous Mediterranean type. The series is a mature one with a mean age of 33 years. The mean stature of this group, 164 cm., is moderate and is typical of the smaller Mediterranean race as defined in earlier chapters.

The bodies of these Yemenis are slightly built; gross observations on constitutional type show the Yemenis to be predominantly leptosome in 60 per cent of cases, and rarely if ever pyknic. The relative shoulder breadth of 21.5 is smaller than that found in most European groups; the

[2] Thomas, Bertram, *Arabia Felix.*

[3] This material is based upon a series of 1500 men measured in the Yemen and Hadhramaut by the author in 1933–34, and presented here for the first time. It will be published in proper statistical form at a later date.

relative span of 102 resembles that of the pure Nordic groups of east Norway, and a relative sitting height of 51.3 is less than that found among most Europeans. The Yemenis, although short, are relatively long legged. Their heads are of moderate dimensions, with a mean length of 188 mm. and a mean breadth of 143 mm., giving a cephalic index of 76, which lies on the upper border of dolichocephaly. It is to be noted that while the head form is the same as that of the Nordic race, the length and breadth dimensions are considerably smaller. The head height of 125 mm. is moderately high, and comparable to Nordic dimensions. The facial diameters are consistently narrow; the minimum frontal mean is 102 mm., the bizygomatic 132 mm., and the bigonial 101 mm. These dimensions are narrower than any that we have heretofore seen in Europe. The face height of 121 mm. is moderate, while the upper face height of 72 mm. must be considered great. It is, in fact, greater than that of many European groups of larger cranial and facial bulk. The nose height of 56 mm. is as great as that of most Nordic groups, while the nose breadth of 33.5 mm. is narrow. The facial index of 92 is only moderately leptoprosopic, while the upper facial index of 55 is extremely leptene. Here one sees a disharmony between the total face height and the great upper face height, which indicates the excessive shallowness and fragility of the Mediterranean mandible. A nasal index of 61 is extremely leptorrhine. The dimensions given above may serve as metrical specifications of the small Mediterranean racial variety in its purest form. Observational specifications follow.

Yemeni highlanders, in exposed skin color on the face, hands, and legs, often appear to be brown, and the characteristic range of exposed skin color lies between von Luschan's #12 and #18. Over 50 per cent of the series have exposed skins of #15 and darker. Really light exposed skin was observed in but one individual, who was a man seldom out under the sun. When the observer inspects the skin of the breast or inner arm in places where the sun seldom penetrates, he sees at once that these people are much lighter. The unexposed skin color, in 83 per cent of the entire series, is a swarthy white, fitting into the von Luschan #10 and #11. Lighter shades running from von Luschan #7 and #9 occur in roughly 5 per cent, while the rest of the series is darker. No individual measured, who came from the Yemen plateau, was darker than von Luschan #18. Vascularity is present in all but one-fifth of the subjects, but, in the majority of cases, is only slightly in evidence. Freckling was found in but 1 per cent of the entire group, and is not a characteristic of the unmixed Mediterranean race.

The head hair of the Yemenis is straight in only 4 per cent of the series, and low waves account for the majority, while 20 per cent have hair which may be classified as curly. This hair form consists of wide, open ringlets

and is the same as the dominant form found among the Veddoid aborigines of the Hadhramaut. Negroid hair does not occur in this group. The hair is of medium texture in 80 per cent of the series and fine in the rest. It is for the most part abundant on the head, and baldness is rare. Only 14 per cent of the entire group showed any signs of baldness other than pathological favus. The beard is slight in over 50 per cent of the series and seldom covers the entire lower part of the face. There are usually bare patches between the ends of the mustache and the chin beard. Body hair, aside from the pubis and axis, is absent in one-third of the entire group and, on the whole, but moderately developed. There is a minority of 10 per cent which shows excessive hairiness. On the whole, the classic Mediterranean racial type is characterized by a moderate to slight amount of body hair, but one must not conclude that excessive hairiness cannot be found among individual Mediterraneans.

The head hair is black in 90 per cent of the series; except for one example of blondism and another of rufosity, the rest of the group is dark brown haired. Beard color, however, is black in only 75 per cent of the group, and the remaining one-fourth of the series is divided between various hues of brown and red. Beard rufosity occurs in 6 per cent of the Yemeni series, while head hair rufosity was found in but one individual. Twelve men out of 400 had beards which contained visible increments of golden-brown hair. Reddish-brown beards are as common as red ones. Since there is no evidence of ash-blondism in either the head or beard hair, while golden and red hues account for all of the existing blondism, it is apparent that the hair of the basic Mediterranean stock, as exemplified by these Yemenis, contains a considerable amount of red pigmentation.

The 25 per cent of brown and blond beards may be matched by 25 per cent of light and mixed eye color. Dark brown, however, accounts for nearly half of the entire series, and black and light brown eyes are definitely in the minority. Of the mixed eyes, green-brown is the most frequent hue, and the dark-mixed outnumber the light-mixed. Not a single case of pure blue or pure gray eyes was encountered in the Yemen; the lightest contained a few flecks of superficial brown pigment.

It is extremely suggestive that the percentage of beards containing evidence of blondism is the same as that of mixed irises, while the head hair color is almost exclusively black. Since it would be difficult to find a purer Mediterranean racial strain than this, one may postulate that some tendency towards a blond mutation is present in roughly one-fourth of this otherwise brunet branch of the Mediterranean race, but this tendency rarely expresses itself in extreme blondism. For historical reasons a 25 per cent incidence in the Yemen is too high to be explained on the basis of outside mixture alone.

Internal eyefolds are wholly absent. Median eyefolds are found in some 10 per cent of the series, while external eyefolds account for another 15 per cent. Thus a condition which is usually considered Nordic is found to exist almost equally among Mediterraneans. In 15 per cent of the series a slight upward obliquity of the eyes is found, and the opening between the lids is usually moderate. The eyebrows are pronouncedly thick in one-fourth of the series, and moderately so to medium in the rest. It is interesting to note that eyebrow concurrency is present in all but 15 per cent of the group. This is slight in most cases, but moderately pronounced in 40 per cent of the whole. One must, therefore, dismiss the idea that these Mediterraneans, at least, have no eyebrow concurrency. A moderate amount of it is apparently a Mediterranean trait. The browridges of these Yemenis are slight in half the group and moderate in most of the other half; only about 5 per cent have pronounced browridges comparable to those so frequently found in northern Europe.

From the observational standpoint, the forehead is of moderate to great height; the slope is less than that usually found among Nordics. Absent or very slight slopes are found in nearly half of the group, while a slope comparable to that of Nordics accounts for the other half.

The nasion depression is usually slight; in many cases nearly absent. The nasal root is almost always high and narrow, the nasal bridge is of greater than medium height in 60 per cent of the series, while its breadth is characteristically narrow to medium. The nasal profile is convex in half of the group. Concave profiles are limited to 3 per cent of the whole, and the rest are straight. The concavo-convex profile, so common in some types of Nordic, is absent here. The nasal tip is usually narrow to medium. It is usually horizontal or inclined slightly upwards; downward inclination occurs in only one-sixth of the group. The nasal wings are alternately medium or compressed, and flaring in but 2 per cent of the group. The nostrils usually take the form of a thin oval in outline, and are set at slightly oblique axes.

On the whole, the nasal form of the Yemenis is quite constant and of little variability. The Yemeni nose is high-rooted, high-bridged, and narrow, with a convex to straight profile, and a narrow, slightly elevated tip, compressed to moderate wings, and narrow, slightly oblique nostril openings. The amount of nasal convexity is greater among Mediterraneans than among most Nordics, and the Mediterranean group as exemplified by this series is, in fact, slightly more leptorrhine than all but the most extreme Nordic groups.

The lips of the Yemenis are of moderate integumental thickness, and their membranous thickness is usually thin to medium. The lips are as a rule only slightly everted. The lip seam is visible in the entire group.

Prognathism is rare; 9 per cent of the total group shows a slight to medium development of the facial variety, while the alveolar type is limited to 2 per cent. It must be remembered at this point that a small amount of facial prognathism is a characteristic white and particularly Mediterranean trait, while alveolar prognathism is more of a negroid character. This, like other negroid traits, is to all practical purposes absent in the Yemen highlands.

Despite the shallowness and narrowness of the Yemenis mandible, chins are of moderate European prominence in 70 per cent of the series. Markedly prominent chins such as one finds in northern Europe among Upper Palaeolithic survivors are lacking. These chins are median in three-fourths of the entire group, while the remaining fourth possess the bilateral form common among Europeans. Only one man out of five has the edge-to-edge bite so frequently found among mediaeval and earlier European skulls, for in dentition and in general jaw development, the Yemenis possess the same features already noticed in the skulls of Mesopotamia as early as Sumerian times.

In the larger features of the face, Yemenis show little or no frontal projection of the malars, while a moderate lateral projection is usual, owing to the small development of the temporal muscle and to the general thinness of the soft parts of the face. Gonial angles are medium or slight in most cases. The occipital protrusion is usually considerable, and flattening is absent or very slight in three-fourths of the series, and the other fourth is as pronounced as among most Nordics.

Although the plateau Yemenis of the region centered about Sana'a may rightly be taken to represent the smaller variety of the Mediterranean race in its purest form, this is not equally true of other parts of the Yemen. In the southern part of the mountain district, in the neighborhood of the cities of Yerim, Ibb, and Taiz, a mixture is seen between this Mediterranean strain and the Veddoid type characteristic of the Hadhramaut. Along the Yemen coast, furthermore, since the climatic conditions are such as to discourage serious physical effort among white men, the countryside has been largely taken over by negroid farmers brought in as agricultural serfs. There is, however, a minority of white agriculturalists, and these belong partly to the Mediterranean type described above. However, there is a considerable coastal population located in the larger towns and maritime villages, which belongs to an entirely different physical type.

These coastal Yemenis are shorter than the plateau Mediterraneans, with a mean stature of only 160 cm. They are smaller-headed, with the extremely short mean glabello-occipital length of 177 mm., a vault height of only 122 mm., and a cephalic index mean of 84.[4] Their faces are broader

[4] The common misconception that the Yemenis as a whole are brachycephalic is due

than those of the plateau people, and very short, with a mean total face height of 118 mm. The nasal index of 64 is less leptorrhine, and the length of eye-slit opening is much greater. These maritime coastal people frequently have coarse and straight hair; their skin color tends to be darker than that of the plateau people, their faces fuller, and their ears prominent and slanting.

These brachycephalic coastal people bear a strong resemblance to Malays and Indonesians, in a number of metrical characters, and there is a tradition that they have absorbed Malay blood in certain families. On the other hand, from the morphological standpoint, most of them look Armenoid, since thick-tipped convex noses and sloping foreheads are frequent among them. In any case, whatever their origin, and it is undoubtedly mixed, they represent an intrusive people borne to southern Arabia by the sea, and have no connection with the original Mediterranean group which developed in the highlands. Evidence of their racial influence may be seen among the agricultural population of the coast, and to a certain extent in the southern towns, but as yet they seem to have exerted no influence whatever on the plateau country. The barrier of a 10,000 foot escarpment and of a complete difference in climate seems to have sufficed to keep the coastal population from the plateau, while the plateau people, at the same time, have penetrated the unhealthy lowlands but little.

Within the Yemen plateau population it is possible for the careful observer to notice a differentiation between a number of sub-types. In the cities is concentrated a specialized and exaggeratedly Mediterranean population with shorter stature, narrower and lower heads, narrower faces and noses, and lighter skin color than the rest of the Yemenis. This city type seems to have been largely selected on an occupational basis, and represents the quintessence of the Mediterranean race. The country people, on the whole, are somewhat larger, somewhat broader-shouldered, and somewhat wavier or curlier in hair form.

Among the tribal and village sheikhs and the officers in the Imam's army one frequently encounters tall, very long-headed, and long-faced examples of the Atlanto-Mediterranean type, which seems to form a socially selected variant in this group. The Nordic-looking people are usually confined to the social stratum from which civil officers and religious men are drawn, and it is more than a coincidence that the ac-

to the fact that Europeans are more familiar with Yemeni sailors than with the more numerous highlanders. Previous anthropometric series of Yemenis include mostly coastal subjects.

See Cipriani, L., **APA,** vols. 60–61, 1930–31, pp. 138–163.
Leys, N. M., and Joyce, T. A., **JRAI,** vol. 43, 1913, pp. 195–267.
Mochi, A., **APA,** vol. 37, 1907, pp. 411–428.
Seligman, C. G., **JRAI,** vol. 47, 1917, pp. 211–237.

knowledged descendants of the Prophet are lighter-skinned and show greater evidence of blondism than the rest of the population. There may perhaps have been a Nordic strain associated with the holy families who entered this region from the Hejaz in early post-Islamic times.

We have no data whatever from Asir, but it is likely that the inhabitants of this mountain province resemble those of the Yemen highlands in large measure. In the Hejaz, there is almost no material,[5] but a few words may be said on the basis of personal observation. Today the city people who derive rich profits from the pilgrim trade and who inhabit mostly Jidda, Mekka, Taif, and Medina are as motley and heterogeneous a group as one would find in Port Said or Honolulu. Thousands of Javanese, of Chinese Moslems, of Bokharis from Turkestan, and of Indian Moslems as well as of African negroes, have been attracted to the holy places and have remained there. The permanent population of these cities is probably less than half Arab. So far these foreign elements have not greatly mixed with the indigenous people, and the old families have kept themselves aloof from these foreign strains, but the importance of the newcomers in the future cannot be exaggerated. The Hejaz will eventually be the seat of a greatly mixed and blended population, drawn from the three primary racial groups of white, negroid, and mongoloid.

Members of the old Hejaz families seem to fall, in many cases, into a clearly differentiated type which, in its extreme form, may be described without difficulty. Its members are men of medium to tall stature; they are broad shouldered, long-bodied, heavy of weight, and of a constitutional type which tends to an excess of both muscle and fat. Their heads are large and mesocephalic to brachycephalic, their faces are both broad and long, their noses frequently large-tipped and fleshy. The chin is prominent and the mandible strong. Their hair is dark brown to black, the beard heavy, and the eye color characteristically brown, although light eyes are by no means uncommon.

Although this Alpine-looking Hejaz type may not yet be established on a scientific basis,[6] its existence will be confirmed by readers who are acquainted with the people of this region. It seems very likely that men of this general type went to North Africa with the early Moslem invasions, for this type is frequent among the aristocratic families in North African cities, particularly in Fez, in contrast with the rest of the population which is almost exclusively dolichocephalic. What the origin of this hypothetical type may be, it would be foolish to consider without some metrical

[5] Mochi, A., **APA**, vol. 37, 1907, pp. 411–428, gives raw data for a series of 12 Arabs from Jidda.

[6] Mochi's series of 12 Arabs from Jidda has a mean stature of 168 cm., a C. I. of 79.4, a bizygomatic of 132 mm., and a nose breadth of 37 mm.

evidence, but we may be sure that it is not of pure Mediterranean origin. It is probably confined largely to the city people and to the older of the indigenous families.

Information on the exact physical character of the nomadic peoples of the Nejd is likewise lacking, but we possess a body of information upon a number of the tribes which pasture their camels in Transjordania and in the desert portions of Syria and Iraq. Notable among these is the Ruwalla tribe made famous by the writings of Lawrence, Musil, Raswan, and others.[7] A series of 270 adult male Ruwalla measured by Shanklin [8] is shorter than the Yemenis, with a mean stature of 162 cm., but other Bedawin tribes, such as the Shammar,[9] are taller, and as one enters sedentary regions in the north the Bedawin stature reaches 170 cm.[10] On the whole, however, the northern Arabs must be considered a medium to short people. A relative sitting height of 51, among the Ruwalla, agrees with that of the Yemenis, and is a standard Mediterranean character.

The heads of the Ruwalla, with a mean length of 192 mm., are a little longer than those of the Yemenis, and the cephalic index of 75 a little lower. The faces of the Ruwalla, with a mean bizygomatic diameter of 130 mm., are extremely narrow. Other dimensions resemble those familiar to us in the Yemen. The skin color of the Ruwalla seems to be on the whole somewhat darker than that of the Yemenis. The hair is usually black or dark brown, and no instance of partial blondism is recorded by Shanklin, although individuals who possess it have been noticed by other observers. It is evident, however, that the 25 per cent of incipient blondism noted in the Yemen is not present in this tribe, although Field has found an even higher ratio among the Shammar.[11]

There are two easily distinguished types among the Ruwalla: a grosser type, with a broader face and straight and medium to broad nose, which bears certain resemblances to the aboriginal population of the Hadhramaut and Dhofar; and what may be described as a finer type, to which most of the sheikhly families belong; this is narrower-faced and narrower-nosed, with often a concave or beaked nasal profile. This hawk-faced type of Arabian aristocrat is better known than the other type, but is probably the less numerous. It reaches its extreme personification in the old warrior Sheikh ʿAuda Abu Tayy, whose lineaments are familiar

[7] Lawrence, Col. T. E., *The Seven Pillars of Wisdom.*
Musil, A., *The Manners and Customs of the Ruwalla Bedawin.*
Raswan, C., *Black Tents of Arabia.*
[8] Shanklin, W. M., **JRAI,** vol. 65, 1935, pp. 375–390.
[9] Unpublished data, courtesy Dr. Henry Field.
[10] Shanklin, W. M., **AJPA,** vol. 21, #2, 1936, pp. 217–252.
Shanklin, W. M., and Izzeddin, N., **AJPA,** vol. 22, #3, 1937, pp. 381–415.
[11] Unpublished data. Courtesy Dr. Henry Field.

to thousands through the charcoal portrait published in Lawrence's *Seven Pillars of Wisdom.*

The purest Mediterranean group in northern Arabia is that of the Solubbies or Sleyb, a curious outcast people who wander about in small family units from camp to camp acting as hunters, leather workers, and tinkers to the Bedawin.[12] The despised position of the Sleyb may be deduced from their ragged clothing, small tents, and the fact that they have no camels and are not allowed to ride on horses. They are, however, regarded as true natives of the desert, and know more about its topography, and can survive in it under greater hardships than any other people. Measurements taken by Dr. Henry Field on a series of these scattered people[13] show them to fall closely to the Yemen plateau standard, and they appear lighter skinned and less Dravidian than the common run of Bedawin.

The origin of the camel-herding Bedawin, with their long genealogies and their complex social structure, has long been a problem to ethnologists. Although there is no space here for a lengthy dissertation upon this subject, it is the author's belief that the camel- and mare-breeding complex of the Bedawin is an off-shoot of the cattle culture of southern Arabia, which is, in turn, closely related to the cattle complex of India and East Africa. With advancing desiccation and the collapse of the early civilizations of southern Arabia, it is likely that one or more tribes and families of Yemenite and Veddoid origin moved northward from the Nejran into the Nejd and the Syrian desert, transferring the economic aspects of their cattle culture to their camels, and its social aspects to their mares. According to this hypothesis the Sleyb and the socially inferior non-Aneyze tribesmen, who live as much on sheep as on camels, represent the earlier elements in the population, and are more purely Mediterranean than the Ruwalla.

(3) IRAQ AND THE COASTAL REGIONS OF THE PERSIAN GULF

The physical anthropology of the Arabic-speaking inhabitants of Mesopotamia has been extensively studied; [14] and we have adequate series to indicate that this population is reasonably homogeneous throughout the middle and lower courses of the Tigris and Euphrates. The stature of these modern Mesopotamians is higher than that of the Arabs of Arabia

[12] The authority on this people is Maj. Glubb, who has written a paper on them soon to be published by Dr. Henry Field.

[13] Unpublished data. Courtesy Dr. Henry Field.

[14] Field, Henry, *Arabs of Central Iraq;* further publications in preparation.

Ehrich, Robert, a series of 33 Mesopotamian Arabs published in Coon, C. S., *Tribes of the Rif.*

proper, with means ranging from 168 cm. in the Kish area south of Bagdad to 171 cm. in the region of Kirkuk. The Iraq army, which is a selected group, has a mean stature of 172.6 cm. Like the Arabs, however, the Mesopotamians are long legged, and their body build is predominantly linear. The cephalic index of various series approximates 76, and only a small minority is brachycephalic.

The dimensions of the head are very similar to those of the Arabs, but with a mean length of approximately 190 and a mean breadth of 142 to 146 mm. in various series. The total face height is moderate, except in the north, where it rises to a mean of 128 mm. The upper face height is in all regions great, and the bizygomatic diameters are moderate, with means of 130 to 133 mm. in the Kish region and among Iraqian soldiers, but run as high as 138 mm. in the Kirkuk region. Both facial and upper facial indices of the Iraqians show leptoprosopic tendencies, but the accent is upon the length of the upper face and not on the total face height.

Nasal dimensions are somewhat larger than in Arabia; the noses are both longer and broader, with leptorrhine nasal indices. The bigonial breadth of 102 mm. is comparable to that of most Arabians. From the standpoint of regional distribution, the most important anthropometric differentiation in the Iraqian area is the increase in face length and breadth found in the upper part of the valley. A heavier, deeper jaw and a broader face, characteristic of the people of northern Iraq, serves as a transition to the facial form of mountaineers of Armenia and Azerbaijan.

The hair form of the Mesopotamians is usually low waves, and it is on the whole straighter than that of Arabs. It is prevailingly dark brown or black, with a small minority of some 5 per cent with blond or reddish hues. The head hair is usually thick, while the beard hair is very strong and, in at least one-half of the group, it is much heavier than the beards in Arabia. The body hair is also on the heavy side, and 50 per cent is recorded as excessive. As in Arabia, the eye color is prevailingly dark brown, and one finds 25 per cent of mixed light hues. The eyebrows are thick, concurrent in all but 12 per cent of the series, and extend widely beyond the orbits in a lateral direction.

In the morphology of the nose the Mesopotamian population differs considerably from that of Arabia. The nasal profile is usually straight, but convex forms are more numerous than concave. The tip is thick in 75 per cent of the group, and depressed in 70 per cent. The wings are rarely compressed, usually medium, and in 25 per cent flaring. Photographs of Iraqians shown in Dr. Henry Field's monograph show that the faces are larger, the noses much more prominent and thicker-tipped, the beards much heavier, the browridges heavier in Iraq than among either the Yemeni Arabs or the pure northern Bedawin. There is a strong Irano-

Afghan element here as well as the Atlanto-Mediterranean, and many transitional forms, while small, fine-featured Arab Mediterranean types are rare.

The Iraqian population is without doubt much the same today as it was in Sumerian and Babylonian times; the post-Islamic acquisition of Arab blood has made very little difference in the racial constitution of this country, while the infiltration of Armenoids from the north has also been negligible. There are, however, some unabsorbed tribes of northern Arabian Bedawin, living in the heart of Mesopotamia, as a study of the extremely dolichocephalic and narrow-faced Ba'ij Bedawin, who pasture their flocks in the so-called "island" between the Tigris and Euphrates, will make clear.[15]

At the head of the Persian Gulf, on the western side just below Basra, is a small, independent kingdom called Kuwait. Kuwaitis are noted navigators, and sail their large dhows full of dates down the Persian Gulf past Oman and around to Aden, and even cross over to Dar es-Salaam and Mombasa. A small series of 40 Kuwait sailors measured in Aden harbor,[16] show closer relationships, in many respects, with Mesopotamia than with the rest of Arabia. However, the stature of 165 cm. is not great, but the bodily build is frequently heavy and thick-set. The shoulders are especially broad, the sitting height great. A mean relative span of 106 far exceeds that of all other known Arabs, and the relative sitting height of 52.5 approaches average European proportions.

There are two chief differences in the anthropometry of the head and face between the Kuwaitis and the normal Mediterranean Arab type as exemplified by the Yemenis; in the first place, the Kuwaiti head, while about the same size as that of the Yemenis, is usually both shorter and broader, with a mean cephalic index of 79.6; in the second place, the faces and noses of the Kuwaitis are much larger. A total face height of 128.2 mm. is as long as any in Mesopotamia, and the upper face height of 73.5 varies accordingly. This excessive length does not apply particularly to the nose, which has a mean length of 56 mm. and a mean breadth of 36 mm. The facial index of the Kuwaitis, 96.4, is extremely leptoprosopic, and the upper face index of 56 extremely leptene. A nasal index of 64.7, while still leptorrhine, is higher than that of most Arabs.

The exposed skin color of the Kuwait sailors is usually darker than that of Yemenis, reaching in half of the series the brown shade represented by Fischer #21 to #25. The unexposed skin color is also dark, and ranges, in most cases, between #10 and #18 in the Fischer chart. Thus the skin color of these people is characteristically light brown. It is, at the same time, however, frequently vascular.

[15] Field, Henry, *Arabs of Central Iraq*, pp. 448–456.

[16] This is part of the hitherto unpublished Arabian series measured by the author.

The hair is straight in half of the series, and in the rest low-waved. It is thus much straighter than the hair of the normal Mediterranean Arabs. The beard and head hair are usually heavy. The head hair is characteristically black, while the beard shows hues ranging from brown to gold and red in one-third of the entire series. The high ratio of 18 per cent of red beards was found in this small group.

The usual 25 per cent of mixed eyes occurs here, while the rest are mostly dark brown. The eyebrows are in all cases thick, and usually concurrent; the browridges are medium to heavy. The morphology of the nose is different from that of the Yemenis, for the nasion depression is frequently great, the nasal root and bridge somewhat broader than among most Arabs, and the profile more often straight than convex. The tip is medium to thick, and usually horizontal or inclined upwards. The nasal wings are medium and seldom compressed. The nostrils are wider than those of the Yemenis, and set at a more oblique axis. The lips are, as a rule, thicker and more everted, and the chin more frequently strongly developed. This straighter-haired, darker-skinned, heavier-nosed, and longer-faced type seems at variance with the rest of Arabia, and has its connections rather with Mesopotamia and regions to the east.

We know little about the population of Oman, except that it is of medium stature, with a mean of 164.8 cm., and the heads are of moderate size, with a mesocephalic index of 78.[17] The Omanis, the greatest sailors of all Arabia, include brachycephals as well as Mediterraneans, and through their centuries of dominance in East Africa and their monopoly of the slave trade, have acquired much African blood. Although all Omanis are by no means negroid, there is a large negro and negroid population in the farming villages and date groves of Oman, as there is on the Yemen coast.

On the other side of the Persian Gulf colonies of seafaring Arabs have settled at various points. One of the most important colonies of this region is at Lenja. A small series of sailors from this port was also measured at Aden.[18] These Lenja men are shorter (161 cm.) than the Omanis, and built like the Kuwaitis; they are, for the most part, sub-brachycephalic, with a mean cephalic index of 81; in facial dimensions they are not unlike Yemenis, and they seem to bear a strain of the same brachycephalic maritime element found along the Yemen coast, as well as in Oman.

They are somewhat lighter-skinned than the Kuwaitis; they are exclusively straight-haired, tend to baldness and very heavy beards, and to have black hair and reddish-brown beard color. The eyes are dark brown in 75 per cent of the series, and the other fourth includes some pure lights.

[17] Leys, N. M., and Joyce, T. A., **JRAI**, vol. 43, 1913, pp. 195–267.

[18] Part of the author's unpublished Arabian series. Only 21 Lenja men were measured.

These Lenja people seem to have more than the usual fourth of partial blondism, especially in reference to beard color.

It is a curious fact that in three ships' crews studied, two from Kuwait and one from Lenja, in each ship the officers, who belonged to ship-owning families, were partial blonds, the crew was mostly brunet, and the cook was a negro.

The Lenja sailors have, almost without exception, extremely thick concurrent eyebrows and heavy browridges. Their noses are characterized by considerable nasion depression, a much lower bridge than is usual among the Arabs, and a greater bridge breadth. The nasal profile is convex in 43 per cent of the group, straight in most of the others. The nasal tip is of moderate thickness and usually horizontal. The wings are frequently flaring, the lips are thicker than those of most Arabs in the integumental sense, but thin membranously, and of relatively little eversion. The general character of the face is the same as that of most Arabs—compressed malars and only moderate gonial angles. As is usual with the coastal brachycephalic type, the ears frequently show an extreme slant. Extreme occipital protrusion is not found, and occipital flattening occurs in one-fourth of the series. The body build is broad and stocky.

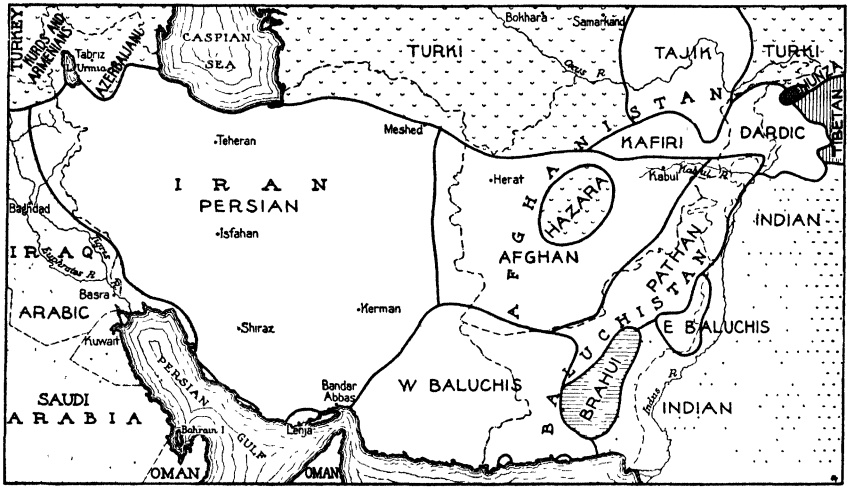
On the whole the seafaring Arabs who occupy both sides of the Persian Gulf conform but slightly to the Mediterranean Arab prototype. Mesopotamian influence is apparent particularly in Kuwait, while it seems likely that the coastal maritime brachycephalic people, who are found in the fishing and seafaring villages of the Hadhramaut and Yemen, came from the Persian Gulf region. Present information is not yet sufficiently complete to permit a careful analysis of this maritime Persian Gulf population, but it is very urgent that Bahrain Island and Oman in particular should be carefully studied in the future.

(4) THE IRANO-AFGHAN RACE; IRAN AND AFGHANISTAN

In the previous section we have seen that the Arabs proper belong almost without exception to the most typical and most highly evolved form of the Mediterranean race. The Mesopotamians, on the other hand, represent a blend or a transitional form between the taller Atlanto-Mediterranean and the Irano-Afghan race, while the Arabic-speaking peoples on either side of the Persian Gulf contain a large contingent of a short, round-headed, laterally built, maritime population which has played a considerable part in the history of Arabian navigation. The Irano-Afghan race, prominent since Sumerian times in Mesopotamia, is the chief population element in the entire highland territory from the western border of Iran to northern India. In the present section we shall deal primarily with the peoples of this mountain area who speak various forms

of Iranian and allied Indo-European languages. Map 12 shows the general distribution of these Iranian-speaking peoples, and of their neighbors.[19]

The languages of Iranian type spoken in this part of the world may be divided into three sub-groups—(a) western Iranian or Persian; (b) eastern Iranian, which includes Pushtu and Baluchi; (c) Dardic, an ill-defined group of Satem dialects closely related to Iranian, but probably not to



MAP 12

THE DISTRIBUTION OF IRANIAN LANGUAGES

The Iranian languages, Persian, Afghan Pushtu, Pathan Pushtu, Baluchi, and Tajik, as well as the closely related Dardic, including Kafiri, have been left unstippled. One Iranian language, Ossetian, which is spoken in the Caucasus, is not shown here. Sanskrit derivatives are indicated by large dots, and non-Indo-European languages by other stipples. The linguistic boundaries are not exact, since the purpose of the map is instruction and clarity rather than technical accuracy. The boundary between Persian and Pushtu is actually vague, since the two languages overlap widely.

be included as a branch of the general Iranian stock. Its relationship is parallel to Iranian rather than derivative.

The present kingdom of Iran, formerly called Persia, is for the most part occupied by Persian-speaking peoples. In the northwest, the Azerbaijani Turkish speech of the eastern Caucasus is the commonest medium, while groups of Indo-European-speaking Armenians and Kurds are also found in this part of Iranian territory. The southern shore of the Caspian Sea is somewhat of a linguistic medley, with small groups of Turkish speakers, while the whole northeastern border country of the Iranian kingdom stretching east of the Caspian is occupied by Turkomans, who

[19] I am indebted to Dr. Gordon T. Bowles for help in preparing both the map and this summary.

continue over into northern Afghanistan. The valley of the Oxus River in northwestern Afghanistan is really Afghan Turkestan.

In the eastern part of the Iranian kingdom, in Khorassan, one finds not only Persians, but also Pushtu-speaking Afghans. The whole southeastern corner of Iran is occupied by Baluchis, who reach nearly as far west as the seaport of Bandar Abbas, which lies just east of the Arabic-speaking town of Lenja. This southeastern section occupied by Baluchis is called Persian Makran. These Baluchis are part of the western Baluchi group, which also occupies most of Baluchistan. They are separated from the eastern Baluchis by groups of Indian speakers and by the non-Indo-European-speaking Brahui.

In northern Afghanistan, immediately south of the Turki area, lies the inaccessible mountain territory of the Kafir, a curiously primitive group of Dardic speakers, who resisted the attempts of the Afghans to convert them to Islam until early in the present century. These Kafirs are divided into strictly segregated social classes, representing conquerors and aborigines. The conquering groups speak various Dardic dialects, while it is said that some of the aboriginal peoples belonging to socially inferior clans and villages speak non-Indo-European languages. The exact nature of these languages, however, has not yet been determined. To the east of Kafiristan is the Hunza country, north of Gilgit, where a number of languages of apparently Caucasic affinity are spoken. The best known of these is Burushaski.[20] Other languages spoken in the Tibetan Himalayas may be related to this same linguistic family.

The Pathan group is divided into two main sub-divisions. One is that of the western Pathans, or Afghans proper, who live in the country which extends from beyond the Iranian border to Jallalabad, and includes the territory of Kabul and the plains of Kandahar. The eastern Pathans occupy the northeastern part of Baluchistan, including the Suleiman Mountain range, and the southern two-thirds of the Northwestern Frontier Province of India. These eastern Pathans include the Pathans proper, the Afridis, the Mohmands, and the Waziris.

In the Hazara Jat of central Afghanistan, southwest of Kabul and southeast of Herat, lives an isolated body of Turkish-speaking people who are historically and racially of Mongol origin, being a remnant of the great Mongol expansion of the fourteenth and fifteenth centuries. These Hazara have tended to be endogamous, and have had little influence on the physical type of the Iranian-speaking peoples.

Outside of the area which we shall discuss in this chapter, but included on Map 12, are the Tajiks, sedentary agricultural peoples of Iranian speech who live in the mountains of northwesternmost Afghanistan

[20] See p. 175.

and adjoining parts of Russian Turkestan. They are descended from an early sedentary population of the Turkestan plains area, which was driven into the mountains by the inroads of Turkish-speaking peoples, who now occupy most of the Turkestan plain. Racially, the Tajiks are predominantly Alpine, and therefore will be discussed in the next chapter.

Let us first consider the racial characters of the Persians themselves. Very little has been published about the physical anthropology of this people, but, with the help of unpublished material, it is possible to make a number of reasonably accurate generalizations about their physical type.[21]

In the first place, they belong as a group to the Irano-Afghan branch of the Mediterranean race. Their stature varies regionally from about 164 to 169 cm., and thus ranges from medium to moderately tall. The relative sitting height is in most groups low, indicating that the long-legged, short-bodied condition of the Mediterraneans seen in Arabia is also prevalent here. The cephalic index is usually low, ranging from 73 to 76 in different groups, although one mountain tribe, the Bakhtiari, is brachycephalic.[22] The actual head dimensions are slightly greater than those among Yemenis, but of typically Mediterranean proportions. The mean head lengths range about the 190 mm. mark, and the head breadths about 141 or 142 mm. The faces are similar in breadth to those of Arabs, but the bigonial diameters are greater, ranging between 105 and 110 mm.; the faces are, at the same time, variable in length, but, on the whole, longer than those found in most parts of Arabia. Facial indices are leptoprosopic, upper facial indices leptene, and the noses are markedly leptorrhine, and usually convex in profile. As photographs of these people show, the jaw is frequently deeper and heavier than is the case among Arabs.

Although the Persians derive their language from Nordics who entered the Iranian plateau from the plains to the north, there is little evidence of Nordic blood in the population except as it appears rarely among individuals. Pigmentation is prevailingly dark. The hair color is usually black or dark brown, with a minority of reddish-brown and brown tints among certain isolated groups such as the Lurs in eastern Iran. Eye color is usually dark brown, but the usual minority of mixed eyes is characteristic, and is especially marked among the Lurs.

In addition to the Bakhtiari, there are small enclaves of brachycephalic

[21] I am deeply indebted to Dr. Henry Field for permission to summarize his unpublished series of 52 Lurs, 46 men from Yezd-i-Khast, and 73 from Kinareh. Older references include

Chantre, E., **BSAP,** vol. 14, 1895, pp. 26–29.
Danilov, N. P., **IILE,** vol. 88, 1894, Cols. 1–147
Houssay, M., **BSAL,** vol. 16, 1887, pp. 101–148.
Khanikoff, N., *Mémoire sur l'Ethnographie de la Perse.*

[22] Kappers, A. C. U., *The Anthropology of the Near East.*

peoples in Iran, particularly in the cities, but the population as a whole is long-headed. Persian brachycephaly may have been derived from two sources, from the Alpines and Armenoids to the north, and from the Baluchis to the south. The Bakhtiari say that their ancestors came from the Lebanon country in Syria.

The published information upon the physical type of the Afghans is even scantier than that from Persia, but again we may fortunately draw upon unpublished information.[23] These Afghans and Pathans are in most respects as similar to the Persians as they are to each other. The Afghans, however, are shorter than the Pathans, since the former have a mean stature of 163 cm. and the latter of 170 cm. The body build of both people is slight to intermediate. A relative sitting height of 52.6 found among Afghanis is close to that of Europeans, while most of the Pathans fall a point lower. The heads of these people range in length from 188 to 192 mm. by tribes, and in breadth from 141 to 145 mm. The cephalic indices of the Afghanis and Pathans vary between tribal means of 72 and 75; except for the Khattak and Bangash, who live in proximity to the Baluchis, and who have a mean of 77. The vault height of all of these peoples is quite low, with means of 121 to 123 mm. Faces are usually long, reaching a maximum mean of 129 mm. among the Afridis, and are at the same time only moderately narrow, with bizygomatic means of 135 to 137 mm. Foreheads and jaws are of moderate dimensions; 104 mm. is the usual mean for the minimum frontal, and 103 mm. for the bigonial.

In the total face height and the three facial breadths, these Pathan speakers cannot be distinguished from Nordics. The upper face height, however, serves as a means of differentiation, since it is extremely long; and the noses, at the same time, reach the extreme length of 61 mm. Their mean facial index of 94 and upper facial index of 56 place these people in an extremely long- and narrow-faced category, while the nasal index of 61 confirms their extreme leptorrhiny.

If one compares these measurements with those from the Yemen on the one hand and from the eastern provinces of Norway on the other, one sees that the Iranian-speakers are much closer to the Nordic mean than to that of the normal Mediterraneans. The head dimensions of the Afghans and Pathans are slightly smaller than those of Nordics, and the

[23] Dr. Gordon T. Bowles, who measured some 6000 adult males in the country running between eastern Afghanistan and Burma, all of whom were inhabitants of the Himalayan foothills and valleys, and of the adjacent Tibetan plateau, has kindly given me his permission to draw upon his series of 40 Afghanis from the Jillalabad plain, 40 Afridis, 42 Mohmands, and 40 Khattak and Bangash. With the addition of 6 Gilzais, this makes a total series of 168 Pushtu speakers from Afghanistan. Published data from this region may be found in the *Ethnographic Survey of India*, Calcutta, 1908. (See Anonymous, *Anthropometric Data from Baluchistan.*

vault height is lower,[24] but the facial dimensions are essentially similar, except that the upper face and nose heights of the Afghans and Pathans are greater.

The Afghans and Pathans, like the Persians, are usually brunet, and at the same time show a persistent minority of blondism, which in this case reflects Nordic admixture. They are heavy-bearded, and possess heavy body hair. Their facial features show a maximum of bony relief, and, on the whole, their facial skeletons seem much heavier and much more strongly marked than those of the more delicate Arabian Mediterraneans. They possess, in common with the Arabian Mediterranean group, a sharpness in definition of feature which stands in contrast to the coarser lineaments of the average Mesopotamian countenance.

In respect to the Dardic group, we have a certain amount of published and unpublished information which will be useful here.[25]

The Kafirs of the Kati tribe, who live in the easternmost section of Kafiristan, are taller and larger-headed than the Pathans, but still essentially dolichocephalic and leptorrhine.[26] They seem also to possess a high ratio of blondism. Like the Pathans, their commonest skin color is a medium brunet white, von Luschan #9, but in hair and eye color they seem to be lighter than the Pushtu-speaking peoples. Thirty-four per cent have mixed or light eyes, as opposed to 20 per cent of Pushtus. Their hair color, according to Stein, is blond or light brown in 28 per cent of the group.[27]

It would seem that the upper class of the Kafirs contains a much larger proportion of the invading, Indo-European-speaking Nordic type than is found among the Persians and Afghans. This is not surprising, since Kafiristan is essentially a refuge area. The lower classes of the Kafiri population seem to be shorter in stature, somewhat smaller-headed, and may perhaps be broader-nosed.[28]

Other Dardic-speaking peoples, studied by Ujfalvy, are of moderate stature, with means between 163 and 166 cm., dolicho- to mesocephalic, with mean cephalic indices of 76, and moderately leptorrhine, with a

[24] Early Nordic crania from Turkestan and from Armenia are low-vaulted. See pp. 169–170, 201.

[25] Dixon, R. B., a series of 92 Burushaskis of Hunza, seriated by the author and published by B. S. Guha, in *Census of India.*

Guha, B. S., *Census of India.*

Joyce, T. A., **JRAI,** vol. 42, 1912, pp. 450–484.

Ujfalvy, K. E. von, *Aus dem westlichen Himalaja.*

Also unpublished materal of Dr. Bowles.

[26] Guha's data on the Red Kafirs presented in his 1931 *Census of India* volume includes no exact figures, aside from observation percentages. Guha, *op. cit.*, p. xviii.

[27] Stein, Sir Aurel, *Serindia,* Appendix C, vol. 3, pp. 1387–1388.

[28] Joyce's series of 18 Kafirs has the relatively short stature mean of 167 cm., a cephalic index of 76.9. His facial measurements appear unreliable.

nasal index mean of 64. The pigmentation is usually brunet, with a minority of blondism, the beards heavy, and the hair form wavy. On the whole, judging from present material, the Dardic-speakers seem to be essentially the same as the Afghans and Pathans, with the addition of a strong Nordic element among some of the Kafirs, and a smaller, essentially Mediterranean factor among the lower classes of the same population.

The non-Indo-European-speaking Burushaski of Hunza, measured by Dixon, may be compared to the Dardic-speaking peoples. The mean stature of 92 Burushaski is 168 cm., the head length 190 mm., its breadth 146 mm., and the cephalic index 77. Facially the Burushaski seem likewise to resemble the Dardic-speakers,[29] and both are essentially Irano-Afghan in racial type. This type is apparently the autochthonous element in the southern slopes of the western Himalayas, as well as in the plateau of Iran and Afghanistan. The invasion of the Iranian ancestors, who brought Indo-European speech to this plateau and mountain country, seems to have had little lasting racial affect, except in Kafiristan.

Before leaving the subject of Iranian-speaking peoples in the western Asiatic highlands, let us return to the northwestern end of this area, and consider the Kurds, who are thought to be the descendants of the Karduchoi encountered by Xenophon and his ten thousand in their march from Persia to the Black Sea.

The present-day Kurds are partial or complete nomads who graze their flocks in the three countries of Iraq, Iran, and Turkey, and who, owing to their warlike activities, have been periodically ejected from each. They are tall men, with a mean stature which, although variable by tribal groups, lies usually between 168 and 170 cm.[30] The mean cephalic index of Kurdish tribesmen measured in Kurdistan and the Caucasic region is consistently 77 or 78; the Kurds have preserved their dolichocephaly intact. Their pigmentation is for the most part brunet, although there is a distinct blond minority which, as with the Riffians, has led travellers to describe the Kurds, as a whole, as blond; their nasal profiles are usually convex or straight, and their total metrical character, so far as it is known, indicates that they are a mixture between the Irano-Afghan racial type described earlier in this section and the ancestral Iranian Nordics, with a larger minority of the latter factor than is usual in

[29] The low facial and high nasal indices given by Dixon are apparently the result of a mistake in locating nasion.

[30] Chantre, E., *Récherches anthropologiques dans l'Asie Occidentale.*

Ehrich, R. W., unpublished series in Peabody Museum.

Kappers, C. U. A., and Parr, L. W., *An Introduction to the Anthropology of the Near East.*

Nassonoff, N. W., **IILE,** vol. 68, 1890, pp. 400–401, résumé in **AFA,** vol. 24, 1896, pp. 646–647.

Iran. Culturally and racially they have conserved the ancestral type with more fidelity than the majority of their linguistic brethren. It is particularly remarkable that, living in close proximity to pronounced brachycephals in Anatolia, Armenia, and the Caucasus, the majority of them have preserved their ancient dolichocephaly.

All groups of Kurds, however, have not fully escaped this brachycephalization. The Bilikani Kurds, who live among Armenians near Erivan, have a mean cephalic index of 84; others, who live in northeastern Iraq and who are fully sedentary, have been altered to a lesser extent through admixture. A small sample measured at Kirkuk has a cephalic index mean of 82, and a mean stature of 170 cm.; despite the change in head form the facial dimensions remain both long and narrow; the facial index of 93 is leptoprosopic, the nasal index of 60 on the lower border of leptorrhiny. The Kurdish facial features are more persistent than the Kurdish head form.

(5) THE TURKS AS MEDITERRANEANS

In most of the Eurasiatic land mass, the brunet Mediterranean world is blocked from direct contact with mongoloids by intervening populations of other kinds of white men, but there is one exception to this rule. The Turkomans who live east of the Caspian, south of the Aral, west of the greater oases of Russian Turkestan, and north of the Iranian plateau, form an extension of the Mediterranean race into central Asia, where their territory borders on that of partially or fully mongoloid peoples to whom they are linguistically related. A few of them are likewise to be found in small colonies in the northern Caucasus.

The purer tribes of Turkomans are as a rule those who have not settled down, but who still maintain their pastoral nomadic existence. As an example of almost wholly unmixed Turkomans we may consider the Yomuds who live in the oasis of Khoresm, in Russian Turkestan.[31]

Several of the Turkoman groups studied in Iraq and in Turkmenistan are tall, with mean statures of 169 and 170 cm., but this is not true of all of them. The Yomuds, for example, have a mean of but 166 cm., as do their neighbors the Chaudir. The Yomuds are dolichocephalic, with a cephalic index of 75.2, and absolutely long-headed, with a mean head length of 194 mm. Their auricular height is very great, 132 mm., and they are markedly hypsicephalic. Other Turkoman tribes have cephalic indices ranging from 75 to nearly 80, but all seem to have auricular heights of 129 mm. or over.

[31] Iarcho, A. I., **AZM,** 1933, #1–2, pp. 70–119.
See also, Kappers, C. U. A., and Parr, L. W., *op. cit.*
I shall also use a series of 31 Turkomans measured at Kirkuk, Iraq, by Mr. Robert W. Ehrich, with his kind permission.

With the great vault height goes an extraordinary height of the face; the mean for the Yomuds is 130 mm., and the same great facial length is found among all Turkoman groups studied. A mean bizygomatic diameter of 138 mm., absolutely on the narrow side of medium, yields the hyperleptoprosopic facial index of 95. The forehead and jaw, with mean breadths of 105 mm. and 108 mm., respectively, are by no means narrow. Narrower jaws, however, are found among Turkomans in Iraq. The mean nose height of Yomuds, 59 mm., and the nose breadth, 36 mm., combine to give the Turkomans the very leptorrhine nasal index of 61. In some Turkoman groups the index is as low as 59, or hyperleptorrhine.

All of the Turkoman tribes are predominantly brunet in head hair color; the majority of head hair is black, straight or slightly wavy, and of fine texture. The beard, however, is sometimes lighter; among Turkomans in northern Mesopotamia no black beards were observed in a small series, and while 50 per cent were dark brown, the remainder were reddish-brown, red, and blond. Part of this beard blondism may have been derived from Kurdish mixture, but part must be native to the Turkomans.

Among the Yomuds, 65 per cent of eyes are pure brown, and the commonest color is dark brown; the same is true among Mesopotamian Turkomans, although mixed groups are darker eyed. Among the Yomuds the 35 per cent minority of eyes are all mixed, and most of these are dark mixed. Blondism of the iris is thoroughly mixed and definitely submerged.

Among Yomuds, the beard development is usually heavy; eyebrows are of moderate thickness. The forehead is of medium slope, as a rule; the browridges slight to medium in development. Most of the Yomuds have an oval face form, and a deeply excavated horizontal facial profile; the nasal root is almost always high and thin, the profile straight in 65 per cent of cases, and convex in most of the others. The nasal tip is of moderate thickness, and usually horizontal; it is elevated more often than depressed. The nostrils are oval and often parallel, the wings usually medium to compressed. The Turkoman nose, with its high, narrow bridge and its great absolute length, is definitely of Irano-Afghan size and proportions. The lips are usually thin, and little everted.

A trace of mongoloid admixture appears through the presence of a slight inner eyefold in 7 per cent of Yomuds; this is never, however, pronounced. In Mesopotamian Turkomans it never or almost never appears.

The Turkomans, as exemplified by the samples described above, with their medium-statured to tall bodies, slender build, thin extremities, and long, thin faces, with noses which reach the white extreme in height and thinness, form a characteristic racial sub-type of their own. They form a variety of the Irano-Afghan race, but differ most succinctly from other branches of it in one feature, the possession of an extremely high head

vault. In this feature and in others they resemble the Corded people who first appeared during the Neolithic.

The usual explanation given to account for the Mediterranean racial character of this Turkish-speaking people is that their linguistic ancestors were mongoloids who became transformed racially through the absorption of the old nomadic population of the central Asiatic plains. This explanation, however, seems inadequate; in the first place, the Scytho-Sarmatian nomads were Nordics, and there is not enough blondism in the Turkomans to permit such a derivation. In the second place the central Asiatic Nordics were broad-faced, and the mixture of a broad-faced white with a broader-faced mongoloid strain could hardly produce a facial form narrower than either.

Furthermore, they are probably not Turkicized brunet Iranians from the plateau, for their vault heights are too great for such a specific and recent relationship. The most logical explanation is that which has already been set forth in Chapter VII, that the Turkomans are descended from the early white people who went northward into Mongolia bearing Altaic speech, agriculture, and later, horse nomadism; their partially mongoloid relatives include the Kirghiz and the Turkish-speaking peoples of both Chinese and Russian Turkestan. That the Turkomans in their purest form have not wholly escaped a mongoloid infusion is to be expected.

Other Turkoman peoples show more mongoloid features than those studied, or than those in Turkmenistan proper. A mixed group of Turkomans is to be found in the northern Caucasus, that asylum for small fragments of peoples. This group includes sections of the tribes of Chaudir, whose main home is in Khoresm, and of Suyun-Djadji and Igdir. These Turkomans are shorter than the Yomuds, with a mean stature of 163.5 cm., and rounder headed, but equal in face and nose heights. They are darker eyed, less heavily bearded, straighter in forehead profile, and frequently round faced; their horizontal facial profile is often flat, their noses lower rooted. In mixture with a mongoloid strain which is perceptible in most individuals but strong in few, they have partly assumed the lateral breadth dimensions of the mongoloids, while retaining the sagittal length and height dimensions of their Mediterranean ancestors, except in head height and in stature; in soft part features, their position is intermediate.

Close relatives of the Turkomans, and less exposed to mongoloid influences, are the Azerbaijani Turks, who occupy a large territory in northwestern Iran on the southeastern shores of the Caspian, and whose territory also includes a large portion of Russian Transcaucasia. Here the Azerbaijans have, besides a province which is theirs almost uniquely, scattered pastures and villages farther west and north, in the neighborhood of Kurds, Georgians, and Armenians.

These Azerbaijanis may be divided on a racial basis into two groups: those who are still mainly pastoralists and who are essentially similar to the Turkomans in all physical features, and those who live in scattered communities in Armenian, Georgian, or other territory and have been altered by local admixture.[32] The longest-headed groups have cephalic index means ranging from 76 to 78, the roundest-headed as high as 81. The brachycephalizing agent in the latter case is not mongoloid, as with the Turkomans living on the northern slopes of the Caucasus, but Alpine, as with Armenians and Georgians. The head height and face height retain much of their original elevation among most of the Azerbaijanis, and the facial form is the same as with Turkomans. A majority of dark brown rather than black hair, however, is characteristic of the more altered groups, as is a ratio of over 50 per cent of mixed and light eyes. The mongoloid traits which appear sporadically among the Turkomans are here almost never encountered.

The Azerbaijanis, like the Turkomans, are members of the Irano-Afghan family of the Mediterranean race. Their ancestors entered Iran from the plains east of the Caspian at the beginning of the present millennium, and took part in the western thrust of Turkish peoples across northern Iran and into Anatolia, where other branches of the same ethnic family, the Seljuks and Osmanlis, founded empires, the latter destined to expand into southeastern Europe. The racial history of the Osmanli Turks in Anatolia and in Europe will be dealt with in the following chapter.

(6) THE VEDDOID PERIPHERY, HADHRAMAUT TO BALUCHISTAN

Although this chapter is primarily concerned with the Mediterranean race, it will be necessary, for the sake of geographical continuity, to discuss certain non-Mediterranean racial elements in southwestern Asia before turning back to the eastern end of the Mediterranean Sea and continuing the study of the rest of the Mediterranean racial area. These racial elements may be lumped under one category, the Veddoid. Veddoid-looking people are first noticed, in proceeding from west to east, in the country around Aden, and as a minority element in the population of southern Yemen. In the Hadhramaut country they become numerically important; while among the Mahra, Qara, and Shahara, the non-

[32] Anserov, N. I., **AZM,** 1934, #1–2, pp. 109–115.
Djawachischwili, A. L., **AFA,** vol. 48, 1925, pp. 77–89.
Chantre, E., *Récherches anthropologiques dans l'Asie Occidentale.*
Erckert, R. von, **AFA,** vol. 18, 1889, pp. 263–281, pp. 297–335; vol. 19, 1890, pp. 55–84, 211–249, 331–356.
Iarcho, A. I., **AZM,** 1932, #2, pp. 49–83.

Arabic-speaking tribesmen who live between the Hadhramaut and Oman, they constitute the principal racial factor in the groups mentioned.

In the Hadhramaut country there are tribes and clans of Arabs who entered the valley from the west and north in pre-Islamic and post-Islamic times; there are also holy families of Sayyids, who concern themselves with the spiritual life of the region; besides these Arabs, however, and besides the so-called Bedawin who are the subjects of this section, other population elements of relatively recent arrival must be mentioned. These consist of two groups, an African and a Southeast Asiatic.

Negroes have been imported into the Hadhramaut as agricultural slaves ever since the beginning of the sea-power of Oman in the Middle Ages, and probably were introduced in smaller numbers in even earlier times. These negroes and descendants of negroes, bonded and emancipated, form a large community which is called by the general term *Hojeri*. This class remains at least as distinct as the negro group in the United States; although there is much mixture, the Arabs and Bedawin still remain almost wholly free from negroid traits, since the product of the mixture remains, as a rule, in the Hojeri category.

These Hojeris are numerous on the Yemen coastal plain, and a very old class of Hojeris exists in the southern Yemen, probably since the time of the Abyssinian domination in the century just before the arrival of Islam. They are not, however, found in the Yemen plateau country, which we have already designated as the home of the purest Mediterranean racial type in Asia. In the Hejaz negroes are numerous, and in the Nejd every important family has its negro or negroid slaves, while a subservient class of blacksmiths is partly negroid.

In the Hadhramaut itself, and in the Mahra and Dhofar regions, the free tribesmen of Veddoid racial tendency distinguish carefully between themselves and negroids, and use as their primary basis of judgment, when genealogies are not known, hair form and facial features rather than skin color. Besides the Hojeris of slave descent there are villages of Somalis along the coasts of the Hadhramaut country, and also in the valley itself. These Somali villages are suburbs of straw huts, built outside the walls of the proper masonry towns of the Arabs. The Somali arrival is still so recent a phenomenon that these people have kept their own language and customs, and show no tendency toward assimilation, either physical or cultural.

Whereas the African element in the South Arabian population has kept itself distinct, the opposite is true of the immigrants from southeastern Asia and Indonesia. For centuries it has been a common practice for members of the Arab families of the towns in the valley, for example, Terim, Saiwun, and Shibam, to go as young men to Singapore, Batavia,

and Colombo, and to set up shop as merchants. This practice dates back to the time when Hadhrami missionaries converted the Malay to Islam, and probably even earlier. The cultural influence of the Hadhramis on the Malay States and Indonesia has been profound, and, to a lesser extent, the reverse is true. From the racial standpoint, however, the few thousand Hadhramis have made little impress on the millions of Malays, while the merchants who have brought their native wives home from Singapore and Java have introduced an important mongoloid factor into the valley. Except for the Sayyid group, it is the upper stratum of Hadhramaut society which has been affected by this mongoloid infusion. The Bedawin remain genetically isolated from mongoloid and negroid alike.

These Bedawin represent a variety of blendings between the standard southern Arabian Mediterranean type, and one or more alien strains which are neither mongoloid nor negroid. These Bedawin may be divided without difficulty into three types which are not the product of the sorting machine, but which any observer, whether or not anthropologically trained, would notice. The first is Mediterranean, and approaches the Yemenitic form. The second, which we will call the fine type, is hook-nosed and lean bodied; the third, which we will call the coarse type, is broader and lower-nosed, and thicker-set in bodily build. Since the character of the first is already well known, we shall describe only the second and third. In the population of the country from Aden eastward to Mahra, the fine type is the most numerous, forming more than half of the whole; the Mediterranean is nearly twice as common as the coarse type. As one goes eastward into the Mahra and Qara country, among non-Arabic speakers, and also, apparently, to Socotra, the Mediterranean type falls into the background. According to Bertram Thomas's data, the Mahra and Qara belong mostly to the fine type, and the subject peoples, including the Shahara, mostly to the coarse. All cultural data point to the priority of the coarse type as a primitive local population.

In stature these Bedawin are shorter than the Mediterraneans, with statures of 163 cm. for the fine type, and 161 cm. for the coarse; the arms of both are relatively longer than with the Mediterraneans, the legs shorter, the sitting height greater. In all these bodily traits the coarse type exceeds the fine in its divergence from the Mediterranean norm. The heads are smaller than those of most indubitably white groups yet studied; in length and breadth dimensions the two types are much alike, with length means of 180 to 182 mm., and breadths of 148 mm. The resultant cephalic index means are 82 for the fine type, and 81 for the coarse.[33] The vaults are of moderate height; the faces narrow. The fine

[33] The extremely high cephalic indices found by Bertram Thomas in his small series

type has the extraordinarily small bigonial mean of 98 mm., which gives the face a triangular appearance.

In a number of metrical characters these types deviate quite widely from the Mediterranean mean; the distance between the outer eye corners (biorbital diameter) is great, especially in the coarse type, while in the fine type the distance between the inner corners (interorbital diameter) is extremely narrow. The faces are absolutely very short, especially those of coarse type, with a mean of 115 mm.; the noses of the fine type are very leptorrhine (N. I. = 60.2); those of the coarse type nearly mesorrhine (N. I. = 68.1).

In skin color the Hadhramis are definitely darker than the Mediterranean Yemenis. The exposed hue of the fine type—and with the Hadhrami costume most of the skin is exposed—is light to medium brown, ranging mostly from von Luschan #15 to #25, and, in a few instances, very dark brown; among individuals of the coarse type it is usually darker, with nearly 20 per cent in the chocolate-brown class, from #26 to #29. These skins are definitely too dark for white men. The unexposed color of the fine type is swarthy-white to light brown, with the darkest individual at von Luschan #18, a *café au lait* hue. The coarse type again is usually darker, within the same general range.

The hair-form is the most noticeable diagnostic of these types, partly because of the fashion of wearing the head hair long, either loose or bunched on top of the head in a knot. No individual in the series of either type has straight hair; in the former, 40 per cent are curly, the rest wavy; in the latter, 57 per cent are curly. No frizzly or negroid hair occurs in either type. The curls are wide ringlets like those of many European children, and like those cultivated by orthodox Jews and by ladies' hairdressers. Much of the wavy hair might also be curly if it were not combed out. This hair is of medium texture among the first type, often fine among the second.

Correlations and contingencies made upon the total Hadhramaut group show that deeply waved and curly hair form a correlative unit; they are correlated with fine hair, cephalic indices running up to 83, higher nasal indices and shorter stature than the other hair forms. By means of these correlations, using hair form as a primary diagnostic, one may isolate by directional influences a short-statured, short-legged, fine-haired, moderately brachycephalic, euryporsopic, mesorrhine racial type.

In both the coarse and fine types, the head hair is abundant and

of southern Arabian tribesmen may be partly attributed to technical inconsistency. The head lengths seem to be some 10 to 20 mm. short. This may be checked by his mean of 174.8 mm. on 6 Somalis. The standard Somali mean is 192 mm., taken from a series of 80 Somalis measured by the author in southern Arabia. Thomas, B., *Arabia Felix*, Appendix I, by Keith, Sir A., and Krogman, W. M.

baldness rare; in the fine type the beard is sparse, in the coarse type moderate to heavy; the body hair varies likewise. Among the members of the coarse type the head and beard hair are both uniformly black; among those of the fine type, a few brown heads appear, and about 10 per cent of brown and red beards. In the eye color also, the same difference appears; the coarse type has 22 per cent of black eyes, and all but 9 per cent of the rest are dark brown. The 9 per cent represents a mixed minority with gray or green elements in the iris. Among the members of the fine type, partial eye blondism rises to 15 per cent, and there is much mixture between various shades of brown and black. This again indicates the mixed condition of the fine type, and the relatively stable condition of the coarse.

The eyes of both are typically without folds, and show no obliquity. The browridges of the fine type are heavier than those of the Mediterraneans, while among the members of the coarse type 35 per cent of browridges are actually heavy. The greatest difference between the two types comes in the nose. That of the fine type is extremely high-rooted and high-bridged, and extremely narrow; the nasion depression is slight or absent, and the profile, in 72 per cent of cases, convex. This convexity takes the form of a highly beaked curve, unlike the angular convexity observed among northern Europeans, and among many Irano-Afghans. The tip is thin and horizontal, the wings closely compressed, the nostrils thin and parallel.

The noses most frequently observed in the coarse type are deep-rooted under glabella, of moderate height and breadth, often wide; they are straight in 78 per cent of cases, with an everted tip of medium thickness. The nostrils are moderately wide, and the wings intermediate between compressed and flaring.

Among the members of the fine type the lips are thin and little everted; those of the coarse type are thicker and quite frequently everted to a considerable degree. The fine type has little prognathism, while a minority of the coarse type shows both facial and alveolar varieties.

The fine type, with its thin face, has little malar prominence; the coarse type is distinguished by a positive forward projection and a considerable lateral extension. This is purely a morphological feature, however, for the bizygomatic is still absolutely narrow.

It is easy enough to account for the southern Arabian Bedawi of the coarse type. He is obviously related to the Vedda of Ceylon, and to the most important element in the Dravidian-speaking population of southern India. His hair form, his facial features, his pigmentation, and his general size and proportions confirm this relationship. The Veddoid race, in turn, has many eastward extensions, among the Shom Pen of Great

Nicobar, the Toala of the Celebes, and as a racial sub-stratum in many of the islands of the chain running from Sumatra through Java, Flores, Sumbawa, and Timor, almost to New Guinea.

The Veddoids possess an obvious relationship with the aborigines of Australia, and possibly a less patent one with the Negritos. The racial history of southern Asia has not yet been thoroughly worked out, and it is too early to postulate what these relationships may be. At any rate, like all major divisions, the Veddoid group appears to include both dolichocephalic and brachycephalic sub-races. Among the present inhabitants of southern Arabia the Veddoid strain is found in various degrees of dilution. Individuals who could pass for Vedda may easily be found, however, and in a few instances, individuals who are to all extents and purposes Australoid; but these latter, as illustrated on Plate 19, are rare.

The fine type, with its paper-thin hooked nose, is intermediate between the Mediterranean and Veddoid positions in most metrical and morphological characters. Only in its sagittally mid-facial and nasal compression, and in perhaps a slightly greater tendency to brachycephaly, is it different from either. At this point we must anticipate the findings of our analysis of the Dinaric and Armenoid races of Europe and Asia Minor,[34] and restate the principle that in a cross between A and B, the formula $\frac{A+B}{2}$ does not apply to all characters, and most rarely of all, if ever, to the nose. In the formation of the Dinaric and Armenoid racial types, roughly a third of Alpine, when combined with some Mediterranean form produces a brachycephalic, beaky-faced hybrid of considerable stability.[35] If we substitute the Veddoid of brachycephalic tendency for the Alpine, we obtain, by the same principle, the finely featured, beak-nosed Hadhrami. It is possible that the short-statured, low-vaulted, relatively broad-nosed brachycephalic seafaring race of the Persian Gulf and the coastal towns of the Gulf of Aden and the Red Sea is involved in this mixture, but this is unnecessary and, on metrical, morphological, cultural, and historical grounds, unlikely.

Directly across the Persian Gulf from the easternmost tip of Arabia, on the Persian mainland, lies the western boundary of the Persian Makran, the territory occupied by part of the western Baluchis. These are separated by an intrusion of Indians, speaking Sanskrit derivatives, from the eastern

[34] See Chapter XII, sections 13 and 18.

[35] This principle was discovered by Dr. Byron O. Hughes in an extensive statistical analysis of 1500 Armenian males, carried on according to genetic principles. It was stated in his doctor's thesis, "The Physical Anthropology of Native Born Armenians," submitted to the Division of Anthropology of Harvard University in 1938 and as yet unpublished.

Baluchis and from the Brahui, whose language has been linked with Dravidian. Although the Baluchis speak Indo-European languages of the Iranian family, like the Persians, Afghans, and Pathans, their racial relationship lies partly elsewhere.[36] With the Brahui they seem to be the results of a mixture between the Veddoid type isolated in the Hadhramaut, and the Irano-Afghan race to which their linguistic relatives belong. The difference between the majority of the Baluchis and Brahui and the fine type of the Hadhramaut is simply the difference between the small Mediterranean type of southern Arabia and the Irano-Afghan. On the whole the Baluchis are somewhat taller, with stature means from 164 to 168 cm., their heads, however, are of about the same length, from 178 to 182 mm., and the cephalic index hovers about the 82 mark.[37] The facial measurements are much the same, except for an excessive nose length, which is without doubt an Irano-Afghan contribution.

For pigment and morphology we are reduced almost entirely to photographs and general descriptions. It is evident, however, that many of the Baluchis are thin-faced and hook-nosed; that their hair is abundant and seldom straight; and that their skins are dark and their hair and eyes usually brunet.

This survey has shown that there still exists, along the shores of the Indian Ocean, from the mouth of the Indus to the Bab-el Mandeb, a submerged population of Veddoid peoples who are in turn related to the whole early southern Asiatic racial group, which includes, as an extreme and evolutionarily retarded branch, the Australoids. This racial group, in combination with the pygmies, has without doubt had much to do with the formation of Papuans and Melanesians. At present it is impossible to tell how old this Veddoid sub-stratum is in southern Arabia; whether it is as ancient as the Mediterraneans, or is a fairly recent prehistoric intrusion from the east. For a further study of it one must turn to India, but since the present book is concerned with The Races of Europe, we feel that we have wandered eastward far enough, and we shall leave the problems of Indian physical anthropology in the competent hands of Guha and of Bowles.

[36] Metrical data upon which the following discussion is based come from an unsigned publication, entitled *Anthropometric Data from Baluchistan*, a part of the Ethnographic Survey of India series, published in Calcutta, 1908. A few groups are taken from Joyce's publication of Sir Aurel Stein's measurements, **JRAI**, vol. 62, 1912, pp. 450–484.

I am indebted to Dr. Gordon Bowles for the collection and presentation of this material.

[37] One group of Baluchi, the Sangur, represented by 16 individuals in the Ethnographic Survey of India publication, has a mean C. I. of 86.3, but this is due to the possession of a greater head breadth than the others, rather than to a reduction in head length.

(7) PALESTINE, JEWISH ORIGINS, AND THE EASTERN JEWS[38]

An integral part of the racial history of Mediterranean peoples is that of the Jews, who have spread widely throughout the world, and whose cultural position within the ranks of the white race is unique. From the standpoint of the physical anthropologist, Jewish history may be divided into two segments, (a) the formation of the Jewish people, and (b) their dispersion and subsequent racial history. Since the Jews are basically Mediterranean in race, the first segment, and that portion of the second which deals with the Mediterranean world, merit consideration in the present chapter.

The Children of Israel, who formed the basic stock of the present-day Jews, lived continuously and exclusively in Palestine from about 1200 B.C. until the capture of Jerusalem by the Babylonians in 586 B.C. These centuries of Jewish history may be considered the period of formation, and those which follow the Babylonian conquest the period of dispersal, for the first diaspora was initiated by the Babylonian captivity.

The ethnic contents of Palestine, during the second half of the second millennium B.C., was varied. Aside from the Israelites it included the Amorites, whose domain was centered farther to the north, and who had controlled much of Palestine before the spread of Egyptian power northeastward at about 1600 B.C.; the Canaanites, who inhabited the land which bears their name until their absorption into the Israelitish body; and the Philistines, who were a branch of the western sea-peoples who harried Egypt and the whole eastern end of the Mediterranean about 1200 B.C., the time of the Trojan War, and who may have come from the general neighborhood of the Aegean.

Egyptian monuments give us excellent pictures of Philistines, Amorites, and Semites in general, under which last grouping the Canaanites must have been included. The Philistines (Fig. 33) are represented as straight-nosed, European-looking Mediterraneans, with light skins; the Amorites (Fig. 36) as yellowish-skinned and long-faced, with long, convex-profiled noses and, in some representations, heavy browridges. The drawings of the Semites in general (Fig. 34), show sloping foreheads and exaggeratedly Near Eastern noses of types easily recognizable today. The Egyptian artists had a genius for accurate racial representation which emphasized characteristic features and eliminated non-essentials. The Bible, a literary document which is poor in descriptions of persons, indicates nevertheless

[38] The information on which the introductory pages of this section are based is drawn partly from Oesterley, W. O. E., and Robinson, T. H., *A History of Israel* (vol. 1); and partly from data given me by Dr. Robert E. Pfeiffer and by Professor Harry Wolfson. I am especially indebted to Dr. Pfeiffer for the earlier material, and to Professor Wolfson for that concerning the history of the Jews from the time of the Babylonian captivity onward.

REPRESENTATIONS OF PALESTINIANS IN EGYPTIAN AND BABYLONIAN ART

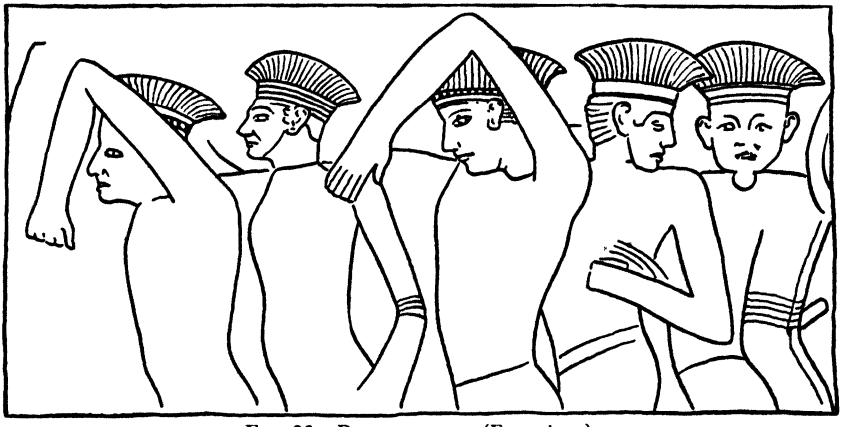
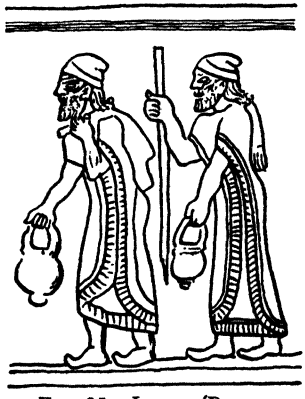


FIG. 33. PHILISTINES. (Egyptian.)

FIG. 34. "SEMITES." (EGYPTIAN.)



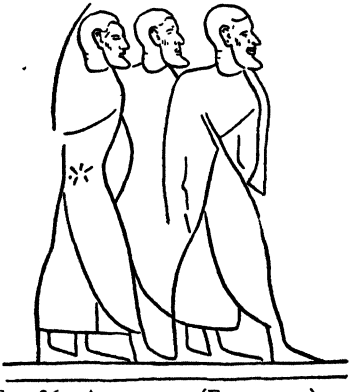


FIG. 35. JEWS. (BABYLONIAN.) FIG. 36. AMORITES. (EGYPTIAN.)

Redrawn from Gressmann, H., *Altorientalische Bilder zum alter Testament*, Berlin und Leipzig, 1927; Plates IV, V, VI, and LVI, Figs. 11, 17, 19, and 125.

that the Amorites were physically different in some respects from other Palestinians—they are called "tall like cedars" and "strong as oaks." [39]

The exact origin of the Children of Israel who entered Palestine, who fought the various independent kingdoms which they found there, and later the Philistines, and who founded a Jewish kingdom, is not known, but Biblical accounts as well as other sources indicate that they were probably nomadic or transhumant Semitic-speakers from the desert border of southern Mesopotamia, who moved northward and westward along the edges of cultivation and finally into Palestine. The tribes of Ammon, Moab, and Edom were probably nomads from the same general source who had established themselves in the countries bordering Palestine before the arrival of the Children of Israel, as were the Amorites; in Palestine itself others attempted to follow them in later times. The Israelites themselves did not arrive as a single, united body, but came at several times, over several routes, and under several leaderships. Once in Palestine they gradually absorbed the earlier inhabitants, both racially and culturally, so that the composite group became eventually Hebraic; the Philistines of the coastal settlements resisted this process the longest.

FIG. 37. ANCIENT JEW.

Redrawn from Chantre, E., *Récherches anthropologiques dans l'Afrique Orientale, Egypte;* Fig. 15, p. 31.

The racial composition of the Jews at the time of David was without doubt simpler than the complexity of their ethnic origin would indicate. The original Children of Israel must have been brunet Mediterraneans, like most Arabs and Mesopotamians, and so, presumably, were for the most part the peoples whom they absorbed in Palestine. Skeletal material from early Palestine indicates the predominance of a Cappadocian Mediterranean type, with a minor incidence of Dinaric brachycephaly.[40] Both Egyptian (Fig. 37) and Babylonian (Fig. 35) sculptural materials give us pictorial representations of early Palestinian Jews, and both show familiar Palestinian facial forms consistent with the representations of Amorites and other Semites.[41]

[39] Amos. ii–9.

[40] See Chapter V, pp. 137–138. In addition to the Bronze Age material, two skulls from Megiddo, dating from the time of Solomon, have been measured. These have cranial indices of 79.6 and 81.4 respectively. See Kappers, C. U. A., *The Anthropology of the Near East.* Four crania from the Jewish catacombs on the Via Appia, Rome, representing a much later date, include one brachycephal of small size, and three dolichocephals with long faces. El'kind, A., **RAJ,** vol. 8, 1912, pp. 1–50.

[41] Reference to the possible absorption of Hittites by the early Jews has been pur-

Although we may be reasonably sure that the Jews of Palestine during the time of David were for the most part brunet Mediterraneans of several types, at least one of which was characterized by a long face and a convex nasal profile, we have not enough data to specify more accurate details. Our task is now to follow the complexities of Jewish history from 586 B.C. onward, and to study the racial characters of the living Jews.[42]

The capitivity of the Jews in Babylon may be considered the first Jewish diaspora. At this time strong Jewish colonies were founded in Mesopotamia, and at the time of the Restoration under Cyrus (538 B.C.) when some of the Jews of Mesopotamia returned to Palestine, the majority of them remained in Iraq. There the Jewish colony continued to exist, and from the beginning of the third century A.D. to the middle of the eleventh, under the successive rules of the Persians and the Moslem Arabs, it flourished as one of the most important cultural centers of the Jews. By the time of Christ this colony had reached the number of a million persons, and in later centuries it grew even greater.

The history of the Jews in Babylon, like that of the rest of the population, was interrupted by the arrival of the Mongols, who wreaked irreparable damage upon the valley of the two rivers, and reduced its population to a fraction of its former numbers. At this time the Jews shrank from over a million to a few thousands. At present the Jewish population of Iraq

posely omitted from the text, since statements that such an absorption took place in quantity are based not so much upon historical records as upon two assumptions: (a) that the brachycephalic, Armenoid-like type of modern, European Jew derives his brachycephaly from a Near Eastern source; (b) that the Hittites were "Armenoid" in race. Both assumptions are erroneous. For an exposition of the Hittite theory, see Oesterley and Robinson, who state: "We have little or no record of the next invaders, the Hittites, though they must have settled in numbers, since they have left their mark on the physical build of the Palestinian peoples" (vol. 1, p. 30). And again: "We may have no details of the Hittite invasion, but it has left its stamp so clearly impressed on the faces of the people that we hardly need further evidence of its historicity" (vol. 1, p. 40). Whether or not some of the Hittites became Jews, the facial features depicted on their monuments were common to most of the peoples of Palestine, Syria, and Asia Minor at that period. Neither the Hittites nor the Jews were Armenoid.

[42] A selected bibliography on the subject of Jewish history, of especial value to anthropologists, is:

Barons, S., *A Social and Religious History of the Jewish People.*

Dubnow, S., *Die neueste Geschichte des jüdischen Volkes, 1789–1914.* 10 vols.; *History of the Jews in Russia and Poland.*

Kastein, J., *History and Destiny of the Jews.*

Margolis, M., and Marx, A., *History of the Jewish People.*

Roth, C., *A Short History of the Jewish People.*

Ruppin, A., *The Jew in the Modern World.*

Wischnitzer, M., *Die Juden in der Welt.*

Dubnow's ten volume work is the principal authority. The concise compilation of Wischnitzer is extremely useful, and has been largely employed here. I am particularly grateful to Professor Harry Wolfson for suggesting this list as well as for his assistance in preparing the accompanying historical summary.

is 87,000, a small number in comparison to its former strength. Those who remain are, however, important as representatives of the ethnic source from which the Jewish colonies of many other Asiatic countries were drawn. Among these may be numbered the Persian Jews, who first left Iraq in the time of Cyrus, but whose major emigration from the same source took place during the twelfth century A.D. The Jews of Bokhara, in Russian Turkestan, are derivatives of the Persian nucleus.

The second Jewish diaspora was the stream of migration of Jews which followed the expansion of Hellenism; it began with Alexander and his successors, and continued under the Byzantine Empire. Although Jews spread to the entire Hellenistic and Byzantine worlds, there were two main centers (aside from Egypt,[43] Syria, and Asia Minor), in which these Hellenistic Jews were concentrated; (a) the Balkans, and (b) the northern shore of the Black Sea. Both of these Jewish centers were established well before the Christian era. On the north shore of the Black Sea the greatest Jewish concentration point was the Crimea, where Jews went with the Greeks after the days of Alexander. The Hellenistic and Byzantine Jews of what is now southern Russia sustained the invasions of the Goths and of the Huns without dislodgement; in the seventh century A.D. they met the invasions of the Tatars. The rise of the Khazar kingdom, a Tatar state, was of some importance in Jewish history, for in 740 A.D. the reigning family and a few of the upper class of the Khazars were converted to Judaism.

The Khazars had two centers, one on the shores of the Caspian Sea at the mouth of the Volga, the other in the Crimea. The Caspian center was abolished between 966 and 969 A.D., but the Crimean center lasted until 1016 A.D. The power which broke up this kingdom was mainly that of the newly established Slavic state of Kiev. After the destruction of their kingdom, some of the Khazars who had accepted Judaism, together with the racial Jews who lived among them and had taken over Jagatai Turkish speech from them, scattered in various parts of southern Russia. Kiev and its neighborhood drew Jews not only from the disintegrated Khazar kingdom, but also from the Balkans, though there may have been Byzantine Jews in Kiev before 1016 A.D., since that Slavic center had been for some time under strong Byzantine influence.

The third and final diaspora of the Jews was that which took them to the Roman world. This dispersion began in the time of the Maccabees, with the first contact between Jews and Romans, but it became particularly active from the time of the second destruction of the Temple in

[43] There was an earlier settlement of the Jews in Lower Egypt, established after the destruction of Jerusalem under Nebuchadnezzar in 586 B.C. These colonists were later absorbed by the Hellenistic group.

70 A.D. onward. The Jews who moved westward with the Romans were drawn from all the places of Jewish settlement, from Palestine as well as from the Hellenistic world. They followed the Romans into Italy, Spain, and France, and into Germany as far as the Rhine. The French Jews disappeared in 1394 A.D., when, as a result of mass expulsions, they were scattered among Jews in neighboring countries. The Italian Jews remained localized in Italy, where they have had a continuous history, and have, at various times, been influenced by successive immigrations of other Jews from other countries. The Jews who originally settled in Spain and in the Rhine Valley in Germany, spread, as a result of expulsions and migrations, to other countries, and the descendants of these two stocks are distinguished respectively by the terms Sephardim and Ashkenazim, borrowed from two Biblical words which, in mediaeval Jewish literature, were applied to Spain and Germany.

The expulsion of the Jews from Spain, along with that of the Moors, took place in 1492 A.D. These Spanish Jews spread at various times to Holland, to England, to Italy, and to North Africa, but the bulk of them took refuge in the newly expanded Turkish Empire. In many places where they went, they became the predominant element in the Jewish communities; in some of the Balkan cities the Jewish population was overwhelmingly if not exclusively Sephardic. Their descendants still speak a form of Spanish known as Ladino, and still preserve a costume and other cultural traits which are reminiscent of their Iberian sojourn.

The other branch of the western Jews, which was destined to become the most numerous element in the Jewish world, was that of the Ashkenazim, descendants of the original Jewish settlers in Germany. While the German Jews were originally confined to the Rhine Valley, after the First Crusade in 1096 A.D. they moved eastward in large numbers until they reached the Slavic countries, although small groups may have preceded them by at least two centuries in Bohemia and Poland.

In Poland and in southern Russia these German Jews met the remnants of the Byzantine Jews and of those who had been dominated by the Khazars, all of whom were being forced northward and westward by political disturbances. This meeting resulted in a fusion, in which the Jews from the west predominated both numerically and culturally. The German Jews, in their migration to the Slavic countries, carried with them their High German speech which developed into the Yiddish language, just as the Spanish Jews carried their Spanish idiom. Both, however, retained Hebrew as the language of literature, liturgy, and education.

As a result of the historical events summarized in the preceding pages, the Jews of the world may be divided into three principal groups: (a) The

Ashkenazim; the central and eastern European Jews, and their offshoots in the newer settlements of North and South America, the Near East, South Africa, and elsewhere. (b) The Sephardim, who are most numerous in the Balkan states and the Near East, but who also live in scattered colonies on both shores of the Mediterranean Sea, and who have emigrated in some numbers to both North and South America. (c) The Oriental Jews, who belong in neither of the two categories just named, but owe their origins to various original migrations from Palestine, or to others from secondary Jewish sources.

The Oriental Jewish world includes colonies in North Africa, Palestine, Mesopotamia, the Caucasus, Persia, Russian Turkestan, and even India and China. Exotic varieties of Jews include the Falasha of northern Ethiopia, the so-called "Black Jews," who are somewhat negroid and who speak Agau, an early Cushitic language; and the Daggatuns, the black Jews of the southern Sahara. In North Africa there are many colonies of Berber-speaking Jews living in the mountains, who claim that their ancestors left Palestine before the Babylonian captivity.

It is possible that Jews entered North Africa with the Phoenicians, and it is certain that Judaism was once strong among many tribes of Berbers shortly before the arrival of the Moslems. The present Berber-speaking Jews are sharply distinguished from the Spanish-speaking Sephardim of Moroccan cities. Arabic-speaking Jews found in the *mellahs* of such cities as Casablanca, Marrakesh, Mogador, and Sefrou are derived from more than one Jewish source, but mostly from the Berber-speaking element.

The Jews were numerous in central and southern Arabia in the centuries immediately preceding Islam, although there is some uncertainty as to what time they arrived there and by what route. Colonies of them were to be found in the cities of the Hejaz and Yemen. In the latter country large numbers of the Sabaean population were converted to Judaism, and one of the sixth-century Sabaean kings, Yusuf Dhu Nuwas, was Jewish in religion. The Hadhramauti immigrants who colonized the Ethiopian highlands and founded the Ethiopian Empire were originally Jewish in belief, but shifted early to Coptic Christianity. During the lifetime of Mohammed the Jews were expelled from the Hejaz, and today they are found only in the Yemen.

At the present time there is no single Jewish community in the world which has been genetically isolated from admixture with Jews from other communities since the period of its first formation. For this reason we cannot assume that any one group of Oriental Jews is fully representative of the Palestinian Jews of the time of Christ. If, however, we study the Jews of the Mediterranean world both separately and as a group, we should be able to find the common racial denominator or denominators

which will reveal to us the physical characteristics of their united ancient Jewish ancestors. Let us begin with present-day Palestine, where although representatives of every type of Jew have come together, there is a complete historical continuity of Jews from the time of Christ.

The modern Samaritans, who are generally supposed to represent the indigenous Palestinian Jewish strain more faithfully than any other, are tall, with a mean stature of 173 cm.,[44] and mesocephalic (C. I. = 78), with heads similar in dimensions to both Yemenis and Mesopotamians. Their faces are moderately long (125 mm.), and narrow (132 mm.), while their thin foreheads are of moderate breadth (103 mm.). Their noses are leptorrhine (N. I. = 66), and of moderate dimensions.

In pigmentation the Samaritans show more than the usual Mediterranean 25 per cent of partial or incipient blondism; out of 35 males, 17, or two-thirds, had black or dark brown head hair, one was blond, and the rest brown. Only 7 (22 per cent) out of 35 had black or dark brown beards, the rest were brown, blond, and red. In eye color, one-third were light or mixed; the rest were equally divided between dark brown and brown.

The general body of Oriental Jews, however, is less tall and less blond than these comparatively specialized and inbred Samaritans. Weissenberg, in a general series of Palestine Jews,[45] finds no blondism, and the short stature of 159 cm., combined with the mean cephalic index of 79.8, extremely narrow faces (128 mm.), and a nasal index of 61. Convex noses, of a type which he designates as "Semitic," are found in 78 per cent of his series.

Weissenberg, following von Luschan, thinks that the so-called Jewish face, and in particular the Jewish nose, were acquired by the Jews through mixture with Hittites.[46] It is, however, unnecessary to postulate the exact source of these well-known features, since they are a part of the heritage of the entire Mediterranean racial population of Asia Minor, Syria, Mesopotamia, and points east. Some of the Jews must have had the high-bridged, convex nose, with a tendency to depression of the tip, from before the time of their dispersal, since it was common among Amorites and Canaanites, and since there is no group of living Jews anywhere some members of which do not possess these traits.

The Yemenite Jews, who form the only large colony of this people in Arabia, may be divided into two groups on the basis of residence and occupation. The largest and best known is the community of city Jews, living in the Kaa'-el-Yahud in Sana'a, and in other towns such as Sa'ada,

[44] Huxley, H. M., *The Jewish Encyclopedia*, vol. 10, 1916, pp. 675–676.
[45] Weissenberg, S., **AFA**, vol. 41, 1915, p. 386. Also, **ZDSJ**, 1909.
[46] See footnote 41, p. 434.

Raudha, Ibb, and Taiz. The others are the country Jews, who live in small villages as farmers. The city Jews live mostly by commerce and by the exercise of manual trades, such as metal work, carpentry, masonry, and the manufacture of jewelry.

The city Jews of Sana'a [47] are for the most part short, slender people, light-skinned but purely brunet in hair and eye color. The commonest shade of the hair is black and of the eyes dark brown. Weissenberg, however, finds four different shades of brown eyes among them. In stature and in cranial and facial dimensions, they resemble the Palestinian Jews greatly, except that the brachycephalic element is almost entirely lacking; the mean cephalic index of the Yemenites is 74. Their faces are absolutely small, with a total face height of under 120 mm., and a bizygomatic of 130 mm. In Weissenberg's series, 60 per cent had straight nasal profiles, and a few even concave.

To anyone familiar with these Jews in their native habitat, it is clear that there are two easily distinguished types among them. The more numerous is only moderately slender, often well muscled in the extremities. The face is short and of moderate breadth, the chin well developed, the lips of medium thickness or in some cases thick, the nose short and straight, with a tip of medium thickness and nasal wings usually medium, seldom compressed or flaring. The nasion depression is medium, and the browridges usually noticeable but not heavy. The eyebrows are thick and convergent, the eyes deep set and the palpebral opening is sometimes narrow.

The second and less numerous type is lighter in weight and slenderer, with small hands and feet, an extremely narrow head, a projecting occiput, and a sweeping curve to the forehead when seen in profile. The face is long and very narrow, the mandible slender, the lips thin, the nose extremely long with compressed wings, the nasion depression slight, the nasal tip somewhat depressed, and the nostrils highly set on the sides. Although the nasal profile is convex, the bridge of the nose is not unusually high.

Both of these types are purely or almost purely brunet in hair and eye color; both are brunet-white in skin color. Owing to the indoor life of the city Jews, they seem lighter-skinned, on the whole, than Arabs. The first type is sometimes heavy-bearded, the second usually scantily equipped with facial hair. The first type, which is the commonest, is found among the common run of Yemenitic Jews; the second may be seen most frequently among the wealthier and more prominent families.

[47] The author has lived among these Jews and is familiar with their physical type, but failed to measure them. The only published series is that of Weissenberg, S., in **ZFE**, vol. 41, 1909, pp. 309-327. The series includes 78 males measured in Palestine.

To a foreigner used to seeing Ashkenazim, the aristocratic type, which would not be out of place among European Sephardim, looks the more Jewish; but to an Arab both look equally so. The Jewish appearance of the coarse type is concentrated in the eyebrows, eyes, and mouth; of the fine type in the nose. Although there is no doubt that much local blood was absorbed into the Jewish community by conversion in pre-Islamic days, it is not difficult to distinguish a Jew from an Arab in Sana'a, regardless of costume.

There is quality of looking Jewish, and its existence cannot be denied. Both Jews and Gentiles are aware of it, and any observant European or Arab who has seen many Jews can distinguish most of them from Gentiles with some accuracy, whether in Europe, America, or the Near East. There is, however, no known physical criterion or set of criteria by which this quality may be measured. It cannot be nasal convexity, for Arabs, Afghans, and many Europeans have high incidences of it, while among Arabian, North African, and Sephardic Jews, the majority of noses are straight. It cannot be tip depression, for that is also common among other peoples. It cannot be the external eye, for while Arabian Jews sometimes have deep-set slitty eyes, European Jews often have prominent, widely open, large-lidded ones. Two other characters may be mentioned as possibilities, but neither is by any means universal among Jews. One is a high attachment of the nasal wings on the cheek, with a great lateral visibility of the septum; the other is a characteristic slant to the ear in both the frontal and lateral planes.

It seems most likely that, while all of these racial criteria enter into this quality, the deciding factor may not be so much physical, as social and psychological.[48] It is possible that the feature which confirms the tentative identification of a person as a Jew, aside from clothing, speech, and other external cultural phenomena, is a characteristic facial expression centered about the eyes, nose, and mouth; this seems to be a socially induced element of behavior. Not all Jews, by any means, have it; those who lack it may be just as "Jewish" in the racial sense as those that possess it; it is the absence of this expression, as well as the absence of other purely cultural diagnostics, which may be responsible for faulty identifications in many such instances. The Jewish look may be seen occasionally upon members of other ethnic groups; it is one of the standard patterns of facial expression which man possesses in his repertoire as a primate.

The Jews are by no means unique in the possession of a national or ethnic facial expression. The English Public School man of standard type,

[48] This subject is not directly concerned with the subject of race. It is, however, introduced here because it has often been confused with race and hence merits full exposition.

trained in a social tradition as definite in its own way as that of the Jew, has a look that can be recognized almost anywhere, and one which is just as easy prey to the cartoonist as is that of the Jew. Many further examples could be introduced, if necessary; however, the only point that needs be brought out here is that the Jews form an ethnic group; that like all ethnic groups they have their own racial elements distributed in their own proportions; like all or most ethnic groups they have their "look," a part of their cultural heritage that both preserves and expresses their cultural solidarity. And since the ethnic solidarity of the Jews is remarkable for its strength and constancy, so the Jewish look seems to be one of the most noticeable and most easily distinguished of characteristic facial expressions found within the racial family of white people.

Leaving their cultural attributes aside, we find nothing mysterious about the physical, racial origin of the Jews. Those with whom we are, in the present section, concerned are a group of Mediterranean Semites, who absorbed, early in their history, the old population of Palestine, which was also largely Mediterranean in blood. The strains which they absorbed contained much of the old Cappadocian element typical of both Palestine and Asia Minor. From this heritage, through subsequent inbreeding and through the influences of social and occupational selection—stronger in their case than with any other important white people—they have developed a special racial sub-type and a special pattern of facial and bodily expression easy to identify but difficult to define.

The Mesopotamian Jews,[49] to continue our study of the Oriental division, are no different as a group from their coreligionists in Arabia, Egypt, Morocco, and Palestine; they are of moderate stature (164 cm.), dolicho- to mesocephalic (C. I. = 78), leptorrhine (N. I. = 61), narrow-faced, straight- or convex-nosed, and brunet in pigmentation. The preservation by them of a Mediterranean type in a Mediterranean country is to be expected, but that these Jews are for the most part truly Jews and not Judaized Iraqians is apparent from their absolutely smaller heads and faces, in comparison to those of the Moslems, and from the dimensions and proportions of their noses.

The Jews in northern Mesopotamia, especially in Mosul, where many of the Arabic-speaking Moslems are themselves round-headed, have been altered by a process of brachycephalization.[50] The same is true in northern Persia; the mean cephalic index for Jews of Urmia [51] is 82, and this rise over the lowland Mesopotamian Jewish level is accompanied by a shortening of the head length, an increase in its breadth, and an increase

[49] Weissenberg, S., **AFA,** vol. 10, 1910, pp. 233–239.
[50] Krischner, H., and Mrs., **KAWA,** vol. 35, 1932, pp. 205–227.
[51] Weissenberg, S., **ZFE,** vol. 45, 1913, pp. 108–119.

in the facial breadth as well. The stature rises to 165 cm., while the nose form and the pigmentation remain constant. It is apparent that a Dinaric-like form has been produced by Alpine admixture, probably through some already Dinaricized medium. In southern Persia, however, the Jews retain their long-headed form.[52]

Turning to the west again, we find ample statistical evidence to prove that the Jews of Egypt and North Africa, as well as the Spaniols or exiled Sephardim, whether living in Salonika and other parts of the former Turkish empire in Europe, or in Palestine, conform closely to the Oriental Jewish types already defined, and form with them an anthropometric unit.[53] The North African Jews are on the whole taller than those of Palestine and Yemen, with a mean stature almost uniformly between 164 and 166 cm.; their cephalic index is 74, and very few individuals are brachycephalic. No more than 5 per cent show any evidence of blondism. The same two facial types noticed in the Yemen were found by Kossovitch and Benoit in Morocco,[54] and confirmed by the discovery of bimodality in facial and nasal index curves. Regional variations of Jews in North Africa are extremely slight. Although mixture with Arabs and Berbers would tend to preserve the original Jewish indices, the absolute cranial dimensions of the Jews are smaller than those of most Berbers, and agree with the Palestinian and Yemenitic means.

The Sephardic Jews of Salonika and of Turkey in Europe differ from the North African ones only in possessing the mesocephalic cephalic index of 78; they are predominantly straight-nosed, and partly blond in one-sixth of the group. Correlations within the Moroccan and Turkish series show that the blond element is no different anthropometrically from the brunet, and that it is probably a minority tendency inherent in the Jews, rather than an accretion acquired in their wanderings. Jews in Egypt differ in no important way from their co-religionists in North Africa and Palestine.

On the whole the Jews of the entire Mediterranean racial belt, from Persia to Morocco, and including those whose ancestors once lived in Spain, are remarkably constant in their racial unity. This unity may be partly due to the fact that these Jews have lived among peoples little

[52] Krischner, *op. cit.*

[53] Principal works of North African Jews are:
Fishberg, M., *Boas Anniversary Volume*, 1906, pp. 55–63.
Kossovitch, N., and Benoit, M. F., **RA**, vol. 42, 1932, pp. 99–125.
Weissenberg, S., **MAGW**, vol. 42, 1912, pp. 85–102.
On Sephardic Spaniols:
Szpidbaum, H., **ACAP**, pp. 207–216; **STNW**, vol. 24, 1931, pp. 146–156.
Wagenseil, F., **ZFMA**, vol. 23, 1923, pp. 33–150.
Weissenberg, S., **MAGW**, vol. 39, 1909, pp. 225–239.

[54] The personal observation of the author agrees with this conclusion.

different from themselves racially, but it cannot be wholly or even largely explained on that basis, since, as has been shown above, these Jews differ less from each other, regardless of geographical distance, than they do from the peoples nearest at hand. Endogamy and an extraordinary ethnic solidarity must be the most important causes.

So far as our present study of living Jewish peoples has been carried, we are justified in concluding that the Jews are an ethnic unit, although one which has little regard for spatial considerations. Like other ethnic units, the Jews have their own standard racial character, in this case a stable combination of several brunet Mediterranean sub-races. How far this Jewish racial entity is concerned with the Jews of central Europe and of central Asia is a question which must be deferred to the next chapter.

(8) THE MEDITERRANEAN RACE IN EAST AFRICA

In the present section we shall consider what is today a second southern periphery of the white racial stock; peripheral in this case to the world of the African Negro. East Africa, with its highland plateaux of Eritrea, Ethiopia, and Kenya, and with its treeless grasslands, forms an environmental zone suitable for the economies of highland agriculture and of pastoral nomadism. Its early connections lie with the north and east, with Egypt and Arabia, rather than with the equatorial forests to the west.

The highlands of Ethiopia, according to studies conducted by economic botanists, seem to contain a number of indigenous varieties of cultivated cereals and legumes.[55] It is possible, but by no means established, that these highlands formed one of the primary centers of Old World agriculture, in which the Neolithic economy originated. It is also possible that part of the agricultural impulse which initiated the high civilization of ancient Egypt was derived from this source.

Later than the development of highland agriculture in East Africa was the introduction and diffusion of pastoral nomadism. The cattle complex, with its elaborate set of social restrictions and of social differentiation on the basis of wealth in herds, was introduced from India by way of southern Arabia, along with the humped zebu, at some none too distant period, probably as late as the first millennium B.C. Its diffusion passed southeastward into the Lake Region, where it was taken up by Bantu peoples and spread, in modern times, as far south as the Cape of Good Hope, where an earlier version of the same complex had already arrived, in the hands of the Hottentots.

In the Horn of Africa region, however, and northward into Egypt, the humped cow is replaced by the more thirst-resisting camel; camel nomads are found in all regions in which agriculture is impractical. The antiquity

[55] Vavilov, N., *Studies on the Origin of Cultivated Plants.*

of camel nomadism in East Africa is unknown, but it cannot be as old as in Arabia, for the camel is an Asiatic animal.[56] Camels did not appear in any numbers in North Africa east of the Nile before 300 A.D., but they must have been earlier than that in East Africa, having been introduced, at some unknown period, from Arabia by way of Suez, of the Bab el Mandeb, or simply across the Red Sea.

The living peoples with whom this section is concerned live by all three economies mentioned—highland agriculture, cattle nomadism, and camel nomadism. They are the whites and near-whites who live east of the equatorial forests, of the Nilotic swamps, and of the deep escarpment of the Blue Nile. They are the Gallas, the Somalis, the Ethiopians, and the inhabitants of Eritrea. They speak languages of two stocks—Hamitic and Semitic. Of the two, Hamitic is the older, for Semitic speech was introduced by colonists from the Hadhramaut only a few centuries B.C.

The Hamitic linguistic stock is divided into three families of languages: (1) Libico-Berber, (2) Ancient Egyptian and its derivative Coptic, (3) Cushitic. These families seem to be nearly as closely related to Semitic as they are to each other,[57] so that a Semito-Hamitic superstock has been postulated, with Semitic as the fourth branch. Ancient Egyptian, according to a recent analysis,[58] may have been merely a blend of the other three. The East African Hamites, however, all speak languages of the Cushitic family, and the word Hamitic, when applied to East Africans, is equivalent to Cushitic.

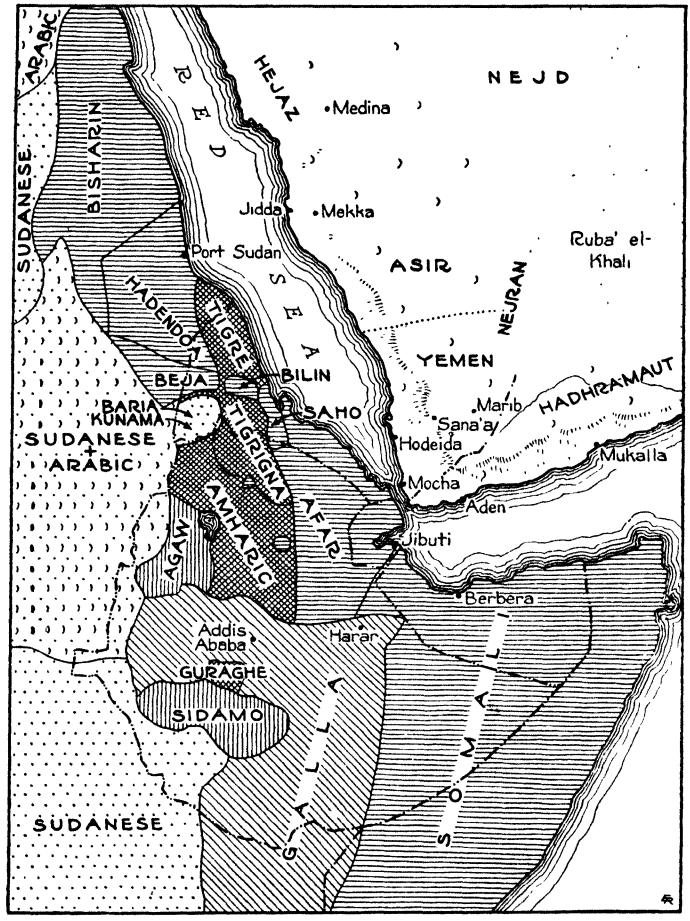
Our knowledge of the racial history of East Africa in antiquity is limited to the southern frontier of the present Hamitic linguistic area. Excavations in Kenya and Tanganyika have uncovered remains of a tall, extremely long-headed, Mediterranean racial type, with a tendency to great elongation and narrowness of the face, in pre-Neolithic times. In Mesolithic times, if not earlier, some of these Mediterranean skeletons show evidence of negroid admixture.[59] The country east of Lake Victoria may be taken as the southern boundary of the area occupied by this race, since to the south all known *sapiens* skeletal remains belong to the ancestors of Bushmen. The center of this area, and its northern boundary, are unknown, owing to the lack of archaeological work in Ethiopia and the eastern Sudan. The present distribution of a similar and without doubt derivative racial type coincides with that of Hamitic languages, and for that reason the term "Hamitic Race," has been frequently employed.

[56] Asiatic in the sense that it must have been domesticated in Asia, where wild camels are still found. It evolved, of course, in America.

[57] Meillet, A., and Cohen, M., *Les Langues du Monde; Langues Chamito-Semitiques*, pp. 81–151.

[58] Information given me by Professor O. Menghin.

[59] See Chapter II, pp. 44–46; Chapter III, pp. 57–59.



MAP 13

LINGUISTIC MAP OF THE EAST AFRICAN HAMITIC AREA

The Cushitic languages of East Africa and of the Anglo-Egyptian Sudan are shown in parallel line representation. The Semitic languages of this region which are derived from Geez are designated by cross-hatching. It should be noted that Tigrigna is the language of Tigré Kingdom; the Tigré language, however, is a related coastal speech. Sudanese Negro languages are shown by means of large dots, Arabic by means of vertical crescents. (Adapted from Meillet and Cohen, *Les Langues du Monde.*)

The living inhabitants of the Abyssinia-Somaliland-Eritrea area may be divided into the following groups:

(1) *The Highland Cushites:* Descendants of the pre-Semitic agricultural population of the northern Ethiopian plateau, speaking early Cushitic dialects. The most numerous and best known of this scattered group are the Agaus, peasants and agricultural serfs living mostly in the kingdom of Gojjam, in the Lake Tsana country.

(2) *The Sidamos:* The corresponding pre-Semitic agricultural population of the present Galla country, living in the midst of Galla tribal territories, and in small separate kingdoms of their own, in southwestern Ethiopia. The best known Sidamo state is that of Kaffa, whose name has been given to coffee. Throughout the Galla country, the numerous peasant class consists largely of linguistically altered Sidamos.

(3) *The Amharas:* This is a general name applied to the Ethiopians proper, members of the four kingdoms of Tigré, Amhara, Gojjam, and Shoa. The Guraghes, who live south of Addis Ababa, speak Amharic, as do all the others named except the Tigrés, whose language is a parallel derivative of Geez. These people are the descendants of the Hadhrami invaders of the late pre-Christian era, and were, until the Italian conquest of 1935–37, the dominant people of Ethiopia.

(4) *The Gallas:* The inhabitants of most of southwestern Ethiopia, including the country as far north and east as Addis Ababa, are Gallas; descendants of a warlike confederation of nomadic tribes who invaded Ethiopia from the southwest in the sixteenth century. The original Gallas, who came in great numbers, were cattle people with the traditional East African dislike for agriculture or menial occupations, and settled down in their present territory as aristocrats. Galla society today is divided into four classes: the Oromo, or Galla proper, the aristocrats; the Tumtu or blacksmiths, the subservient class of artisans who are also farmers; the Faki, a low caste of tanners; and the Watta, outcaste hunters who live in separate villages. The Oromo have, for the most part, submitted to the pursuit of agriculture, while continuing at the same time their cattle raising.

(5) *The Somalis:* The whole Horn of Africa, including the three Somalilands and the Ogaden region of Ethiopia, is occupied by various tribes of Somalis, nomadic Hamites who profess Islam and claim descent from Arabian missionaries. Their origin is not clearly known, but it is evident that there must have been some Galla as well as Arabian mixture, grafted onto a local Hamitic population.

(6) *The Danakil* (also called Afar): In southwestern Eritrea and adjacent parts of the desert of northeastern Ethiopia, as well as in part of French Somaliland, live the Danakil, tribesmen culturally related to the Somalis, who also claim Arabian ancestry. North of the Danakil in Eritrea live other tribes of the same general type. The Somalis, Danakil, and their northern relatives form part of a continuous belt of nomadic Hamites reaching from the Horn of Africa to Egypt; the northern representatives, however, from the Eritrean Beja to the Egyptian Bisharin, have been subjected to strong admixture with Sudanese negroes.

(7) *Negroes in Hamitic Territory:* In Eritrea the tribes of Baria and Cunama, in the midst of Hamitic-Tigré territory, probably represent, in

the linguistic sense at least, an eastward thrust of Sudanese negroes. In Ethiopia proper many Shankalla, negroes brought as slaves from the Blue Nile country, have propagated both as a slave population and through mixture. In Italian Somaliland, it is said that some of the slave tribes subservient to the Somalis speak Bantu. The speech of the Wattas may also be neither Hamitic nor Semitic.

The study of the physical anthropology of this ethnologically and historically complex region may be said to have barely begun; nevertheless it has progressed far enough to warrant reasonably accurate statements as to the racial characters of the more numerous and better known peoples.[60] Before proceeding further, it may be well to state that all of the peoples of this "Hamitic" area, whether Hamitic or Semitic in speech, represent a blend in varying proportions between Mediterraneans of several varieties, especially of the tall, Atlanto-Mediterranean group, and negroes. Other elements include, of course, the Veddoid brought in solution from southern Arabia; there is also a possibility of traces of dilute pygmy and Bushman blood in southwestern Ethiopia and Somaliland, although neither of these has been proved. Needless to say, the Gallas and Amharas have mixed with each other greatly in the regions in which they have been in contact; both the Amharas and Gallas have absorbed the earlier Cushitic agricultural peoples in great numbers. The most important single influence has been the infiltration of negroes, through the slave trade, into the entire Ethiopian plateau region. So extensive has this infiltration been that it is unlikely that a single genetic

[60] The principal works on the physical anthropology of the living in this region are:
Castro, L. de, *Nella Terra dei Negus*, vol. 2, pp. 342–477.
Frasetto, F., **AnthPr,** vol. 10, 1932, pp. 161–187.
Garson, J. G., Appendix to Bent, T. J., *The Sacred City of the Ethiopians*, pp. 286–296.
Klimek, S., **APA,** vols. 60–61, 1930–31, pp. 358–381.
Koettlitz, R., **JRAI,** vol. 30, 1900, pp. 50–55.
Lester, P., **Anth,** vol. 38, 1928, pp. 61–90, 289–315.
Leys, N. M., and Joyce, T. A., **JRAI,** vol. 43, 1913, p. 195.
Puccioni, N., **APA,** vol. 41, 1911, pp. 295–326; vol. 47, 1917, pp. 13–164; vol. 49, 1919, pp. 41–223; vol. 53, 1923, pp. 25–68; *Anthropologia e Etnografia delle Genti della Somalia.*
Radlauer, C., **AFA,** vol. 41, 1914, pp. 451–473.
Verneau, R., Appendix in Duchesne-Fournet, *Mission en Ethiopie.*
In addition to these, the author has used, in the following exposition, a MS. of his own, awaiting publication, and entitled: *Contribution to the Study of the Physical Anthropology of the Ethiopians and Somalis,* based on a series of 100 Ethiopians and 80 Somalis measured in 1933–34.
Principal works on the craniology of this region are:
Castro, L. de, **APA,** vol. 41, 1911, pp. 327–339.
Cipriani, L., **APA,** vol. 53, 1926, pp. 11–24.
Sergi, S., *Crania Habessinica.*
Verneau, R., **Anth,** vol. 10, 1899, pp. 641–662.
Works on the Danakil, Baria, Cunama, and Beja are listed later.

line in the entire Horn of Africa is completely free from negroid admixture; but individuals may be found among the Amharas, Gallas, and Somalis who show no visible signs of negro blood. These individuals are extremely rare. On the whole the negroid element in the Hamitic area cannot be much more than one-fourth of the whole, but it has penetrated every ethnic group and every social level. Just when this penetration had become complete we do not know, but one suspects that it had already occurred by the sixth century A.D., when the Ethiopians ruled the Yemen. The Gallas, despite their tradition of descent from white men, were already partly negroid at the time of their arrival in Ethiopia.

Despite this negroid penetration, and despite a mixture between non-negroid elements, the four ethnic units of Amharas, Gallas, Sidamos, and Somalis are all statistically distinct from each other.[61] What evidence we have for the Agaus suggests that this people constitutes a fifth anthropometric entity. As one would expect, the more purely Hamitic peoples, such as the Agaus, Gallas, and Somalis, are taller than the Amharas. All of these three have stature means ranging from 169 to 174 cm., while 172 cm. seems to be the central mean for all of them. The Semitic speakers range from a mean of 164–167 cm.[62] for the Tigré, the most nearly Arabian of the four main groups, to 167–169 cm. for each of the other three, while a series of varied Ethiopians, mostly from Shoa, and measured in Addis Ababa, rose to the mean of 169 cm. This latter figure may reflect Galla mixture—for Addis Ababa is in Galla territory—or selection. The Sidamos, in contrast to the Agaus, are apparently short (164 cm.).

In bodily build and proportions, all groups are much the same. The predominant type is leptosome, with a relative sitting height index of 50 to 51, a relative span of 103, and a relative shoulder breadth of 21. Long legs and relatively short arms, narrow shoulders, and even narrower hips, are the rule. Few Ethiopians of any category are thick-set, and what little corpulence is seen hangs ill on fine-boned frames. The hands and feet of all but the palpably negroid are small and extremely narrow, the lower legs and wrists usually spindly and ill-muscled. This attenuation of the distal segments of the limbs reaches its maximum among the Somalis. The Sidamos, who are by far the most negroid of the Ethiopian peoples, have the broadest shoulders in proportion to their height, and the narrowest hips.

There can be no doubt that the tall stature of the Gallas, Somalis, and Agaus is an old Hamitic trait, since both the negroid Sidamos and the Semites of Hadhramauti origin are much shorter. The tallness of this

[61] From statistical analysis of author's unpublished material.
[62] From several different series.

East African Mediterranean strain stands in contrast to the moderate stature of the Mediterranean Arabs across the Red Sea, and constitutes a characteristic difference between them. The bodily build of the East African Hamites is typically Mediterranean in the ratio of arms, legs, and trunk, but the special attenuation of the extremities among the Somalis is a strong local feature,[63] which finds its closest parallels outside the white racial group, in southern India and in Australia.

The different groups studied in Ethiopia share a tendency to dolichocephaly or mesocephaly, and to a narrow face form. In the measurements of the head and face, all are fundamentally Mediterranean, and the negroid traits manifested in the soft parts do not reveal themselves in the measurements, except in nose breadth and in the biorbital and interorbital diameters. The heads are larger than those of the Yemeni Mediterraneans; Amharas (in the sense of Semitic-speaking Abyssinians) have vault dimensions of 194 mm. (length) by 150 mm. (breadth) by 127 mm. (height); these figures could apply as well to Nordics as to Abyssinians. The mean cephalic index of 77 or lower [64] for Amharic speakers is in the dolichocephalic to low mesocephalic class; the smaller diameters and higher index of the present-day Hadhramaut population seem to have yielded to the greater size and dolichocephaly of the indigenous Hamitic farmers, as far as the total group is concerned. There is, however, some evidence that while the Tigré people are strongly dolichocephalic, brachycephaly may be common in the kingdoms of Gojjam and Amhara.[65]

The Gallas are on the whole smaller headed than the Amharas, but also mesocephalic. Mesocephaly is also the prevalent head form of both Agaus and Sidamos; among the latter the mean cephalic index is 78, and there is a definite brachycephalic minority. So far the inhabitants of the Abyssinian plateau, whatever their speech and ethnic origin, are dolichocephalic or mesocephalic, and comparable to Mediterraneans elsewhere, especially, as we shall later see, to North African Berbers, as well as to North European Nordics. Among the Sidamos, however, the vault is lower (124 mm.) than among Amharas and Gallas. The Somalis,

[63] Schlaginhaufen, O., **AJKS**, vol. 9, 1934, pp. 265–273.

[64] Verneau's mean is 75.

[65] De Castro, in his 1915 study of Ethiopians, gives cephalic index means of 73.9 for Tigré, 75.4 for Shoa, 80.7 for Amhara, and 83.2 for Gojjam. The Amhara series is represented by 50 men, the Gojjam series by 47. Garson finds a mean C. I. of 81.4 for 12 Amhara men measured by Bent. Against these positive evidences of brachycephaly stands the fact that in none of the composite series of Amharic-speaking Ethiopians, which include Gojjam and Amhara men, are brachycephalic individuals found in sufficient numbers to support these figures. Verneau, out of a series of 83, of which 29 are Gojjamites, finds a mean C. I. of 74.9, and a range of 67–82. In my own smaller series the highest C. I. is 81; C. I.'s of 4 Gojjam men were 74, 76, 77, 80. Both Frasetto (1932) and Klimek (1930–31) fail to find brachycephaly in composite Abyssinian series. At present it is impossible to confirm or refute de Castro's figures.

as contrasted with the highland bloc, are smaller headed and purely dolichocephalic, with vault dimensions of 192 mm. (length) by 143 mm. (breadth) by 123 mm. (height), and a mean cephalic index of 74.5. In this they resemble closely the finer Mediterranean type in Yemen, and some of the northern Bedawin.

Facially this division between highlanders and Somalis is accentuated. The highlanders have minimum frontal means of 104 mm. to 106 mm.; the Somalis of 102 mm. The bizygomatics of the first group fall at 134–136 mm., of the Somalis at 131 mm. The bigonials of the highlanders have means of 101–102 mm., of the Somalis, 96 mm. All are narrow faced, but the Somalis approximate a world extreme. The forehead is in all groups notably wider than the jaw, which reaches a record in narrowness among the Somalis. In face breadths as in vault dimensions the less extreme highland Ethiopians might as well be Nordics as negroids.

The total face heights of the four groups under consideration range from 122 mm. to 124 mm.; the upper face heights from 71 mm. to 74 mm. It is interesting to note that the Sidamos, who are the most negroid, have the broadest foreheads, bizygomatics, and bigonials, the longest menton-nasion heights, and by far the longest upper face heights, of the entire group. It is the Somalis whose upper face height is shortest. All four are leptoprosopic and leptene, the Somalis hyperleptoprosopic.

The noses of Somalis, Amharas, and Gallas are leptorrhine, with nasal indices of 66, 68, and 69, respectively. This regression indicates with some accuracy the relative amounts of negro blood. The Sidamos, with an index of 71, are mesorrhine and the most negroid. In accordance with the principle that the most negroid have the longest as well as the broadest faces, the Sidamos have the longest and broadest noses, with a mean height of 55 mm., and breadth of 39 mm. The Somalis, whose noses are narrowest, also have the smallest, 52 mm. by 34 mm.

In the measurements of the external eye the Somalis differ again from the highlanders; their mean interorbital diameter of 31 mm. is narrow, while that of the highlanders, 34–35 mm., approximates a negroid condition. In the biorbital, the distance between the outer eye corners, the Somalis are narrowest, with 91 mm.; the Sidamos the broadest with 96 mm.

Our survey of the metrical characters of the inhabitants of the Hamitic racial area has brought several facts to light; the agricultural population of the Ethiopian highlands, both indigenous and imported from Arabia, belongs to a tall, dolichocephalic to mesocephalic, leptoprosopic, moderately leptorrhine race, which is Mediterranean in metrical position and cannot be distinguished, on the basis of the more commonly taken measurements, from blond and brunet Mediterraneans of Europe and North

Africa. The Somalis, on the other hand, belong to an extreme racial form; extremely linear in bodily build, extremely narrow-headed and narrow-faced, with a special narrowness of the jaw. The relationship of the Somalis, on metrical grounds, is with some of the peoples of India as much as with the Mediterraneans elsewhere. The leptosome tendency, and the narrowness of the face, remind one of the same tendency found among the mixed Bedawin group of the Hadhramaut. It cannot be attributed to negro-white mixture, for that phenomenon, as witnessed among the Sidamos, has produced a heaping of characters, resulting in an enlargement of both sagittal and lateral diameters of the face, in some cases in excess of either the Hamitic white or the negroid parent. Upper face height and nose height are especially affected. The Somali face and nose are not long, they are merely narrow. The extremely long faces and noses found among the Ba-Hima, the noble class of the Baganda, and supposedly of Galla origin, have acquired a social value, and far exceed those of the Somali. In this tendency to attenuation of the face, we are reminded of Oldoway man and some of the Elmenteita skeletons. This tendency is an extremely old one in East Africa.

In the skin color of the Arabs, however dark the exposed and tanned parts might be, the unexposed epidermis was always considerably lighter. A fundamental difference between Arabs and Ethiopians is seen in this feature, for the latter are usually the same in skin color all over. In fact, the foreheads of Ethiopians are in some instances lighter than their shirt-protected bodies. In the three highland groups of Amharas, Gallas, and Sidamos, the Amharas are lightest skinned, with the majority of shades concentrated in the medium brown category, between von Luschan #21 and #25; individually the series runs as light as #13, a brunet-white, which is approximately the color of the former Emperor, Hailie Selassie. At the other extreme it reaches #34, which is almost jet black, nearer the color of the great Emperor Menelik II. Thus among the Amharas almost the entire range of human skin color intensity is covered, with the exception of rosy or pinkish-white, which probably does not exist among Ethiopians. The Gallas run somewhat darker, with their concentration in the medium to chocolate-brown class, between #22 and #29; their range is somewhat less than that of the Amharas, and the rare brunet-white of the former is in some cases replaced by a yellow of Bushman intensity. Most of the Sidamos are darker than #30, and are thus really dark brown or black.

So far, the progression in skin color has followed that of relative amounts of negro blood, with an immense range covered; the inheritance of skin color in the Ethiopian highlands is not strictly Mendelian in a simple sense, nor is it by any means a case of ordinary blending. If there was

ever a rosy-white shade in the non-negroid element, it has long since disappeared. Among the Somalis, however, an entirely different situation is found, for the majority are lumped around the von Luschan #29. Numbers 27 and 30 account for most of the others; hence there is a single and characteristic Somali color, which is a rich, glossy, chocolate-brown, which accounts for seven-eights of the entire Somali group. A very few are darker, and individuals are as light as light brown, in a very few cases as light as Arabs. The contrast between highland Ethiopians and Somalis in skin color is so great that one must postulate that the original non-negroid narrow-bodied and narrow-faced strain which the living Somalis represent was not white skinned in any sense of the word, for the Somalis are the least negroid people in East Africa.

The Ethiopians themselves are extremely conscious of differences in skin color, and divide themselves into four groups: "Yellow," "Yellow-Red," "Red," and "Black." These groups do not correspond very well with the von Luschan scale, but represent the product of centuries of local experience, and are perhaps more significant from the genetic standpoint. A jury of Amharas and Gallas called 20 per cent of the former "Yellow," as against 8 per cent of the latter; only 2 per cent of either was "Black." In both, the "Red" class was the most numerous; with 47 per cent of Amharas, and 70 per cent of Gallas. Most of the few Sidamos studied are evenly divided between "Red" and "Black." This system could not be applied to the Somalis, whose characteristic hue defied classification.

In hair form the Ethiopians also have their own system, which hardly agrees with ours. It has three divisions; *lüchai*, meaning "straight," *gofari*, meaning "curly," and another term which signifies extremely negroid, or peppercorn. Actually, no single highland Ethiopian with straight hair was measured in the author's series, although one apparently straight-haired Agau was seen. Among the Amharas, 80 per cent were called "curly," and the rest "straight," according to native terminology; among the Gallas the same 20 per cent of "straight" were found, while among the Sidamos this rose to 30 per cent. Actually, the *gofari* class included both curly hair in a Hadhramaut sense, and frizzly hair of a negroid character. Hair which the Ethiopians themselves considered negroid was confined to a few individuals who were to all purposes pure negroes, and undoubtedly slaves.

According to our own classification, 40 per cent of the Amharas have non-negroid, wavy or curly hair,[66] and the rest frizzly; the non-negroid

[66] According to Fischer's findings, our "curly" could be called a negroid-white mixed form.

Fischer, E., *Die Rehobother Bastards.*

class among the Gallas is 30 per cent, among the Somalis 86 per cent. Some of the Somalis actually have straight hair. Although our series of Sidamos is too small to be reliable, it indicates that these people are not as frequently negroid in hair form as are the Amharas.

The latter, however, show their predominantly non-negroid character in the distribution of the pilous system; they have the most frequent baldness, beards which are often heavy, and a strong minority of heavy body hair; while the Gallas and Sidamos are less bearded and less hairy, and the Somalis, with beards comparable to those of southern Arabs, are almost glabrous on the body. Black hair is, of course, characteristic of all groups; a sporadic individual with dark brown or red-brown hair may be found, however, among all of them. The beard shows no difference from the head hair.

In eye color mixtures between several brunet strains are apparent. The Amharas have 47 per cent of dark brown and 11 per cent of light brown irises, with 39 per cent of mixtures between these two, with a light brown iridical background overlaid by rays of zones of dark brown; among the Gallas the same proportions of the same types are found. Among the Sidamos, black eyes begin to appear, and the dark brown shade is in the great majority, while among the Somalis 32 per cent are black and 56 per cent dark brown. In all groups an occasional case of mixed blond eyes occurs, with a green-brown or gray-brown mixture, but these form no more than 2 per cent of the whole.[67] They indicate the persistance of the minority tendency to eye blondism endemic in the Mediterranean racial stock, rather than any northern admixture.

The external eye form varies between the different groups in proportion of negroid blood; the Amharas and the Somalis have few eyefolds, little obliquity, a medium to slight opening height; among the Gallas and Sidamos, the pseudo-mongoloid [68] negroid internal fold is occasionally seen, and a strong minority has oblique and wide open eye slits. Similarly, the eyebrows are thickest and most concurrent among Amharas and Somalis.

Browridges are moderate, in a western European sense, or heavy, in over half of the Somali series; the Amharas are slight to moderate, the Gallas and Sidamos slight or absent. Foreheads are usually high among Amharas, and progressively lower among Gallas and Sidamos; the slope is most variable among the Amharas, among whom all forms are frequent; least variable among the Somalis, among whom it is usually slight. On the whole the more negroid have the greatest slopes.

[67] Higher percentages have been reported among Amharic speakers in some of the northern kingdoms.

[68] Seligman, C. G., and B. Z., *Pagan Tribes of the Nilotic Sudan*, p. 20.

Considerable differences are seen in nose form between the different peoples; the most European forms are found among the Somalis and Amharas, while the Sidamo nose is for the most part negroid in morphology. The Somali noses, although they vary between an extremely leptorrhine and a negroid extreme, assume a normal distribution when tabulated by individual criteria. The mean is a moderate root height, narrow to medium root breadth, moderate bridge height, narrow to moderate bridge breadth, a straight profile, a thin tip, which is inclined slightly upward, medium wings, with thin to medium, slightly oblique nostrils. Although individual Somalis are beaky in nasal appearance, the impression of the group as a whole, and especially of the least negroid element, is that of a straight profile and moderate bridge height; in other words, of a classic Mediterranean nose form.

The noses of the Amharas, while very variable, are as a rule higher in root and bridge, and at the same time broader, thicker tipped, and often inclined downward, with a tendency to flaring nasal wings, and highly excavated nostrils. The Amharic nasal profile is again usually straight. The Galla noses are like those of the Amharas, with a slightly higher ratio of broad and flaring forms. Among the Sidamos, thick tips, flaring wings, and low roots and bridges are actually in the majority, although convex profiles are more frequent than among the less negroid groups. The Sidamo nose is morphologically as well as metrically a hybrid negro-white organ, such as is frequently seen among American negroes.

In all groups, including the Somalis, thick lips are more numerous than thin ones, both integumentally and membranously; lip eversion is also characteristically great in all of them, as is a prominent lip seam. Really thin lips exceed 10 per cent only among the Amharas. All of the groups show some degree of prognathism; facial prognathism is approximately 10 per cent in all but the Sidamos, among whom it is greater; alveolar prognathism is present among all but Sidamos, to the extent of 25 per cent; among the Sidamos almost half are prognathous. The chin is as prominent as among most white men in over 60 per cent of all but Somalis, among whom it is characteristically receding. Frontal projection of the malars is slight in all groups; lateral projection is often pronounced among the Gallas and Sidamos, seldom so among Amharas and Somalis. Prominence of the gonial angles is most frequently marked among Amharas, never among Somalis.

Negroid traits are seen sometimes in the ear—among Sidamos the most and Amharas the least. The negroid ear has a small, soldered lobe, and an excessive roll to the helix. It rarely slants, while the ears of Amharas and especially of Somalis are characteristically set at an angle to the vertical.

Among all of these peoples differences in racial as well as constitutional type is seen, even among the relatively homogeneous Somalis. Here the bulk of the population gravitates between two end types. The more numerous of these two is typified by a long, thin, bodily form with extremely narrow hands and feet, with thin, gracefully built bodies which, among the women, attain a degree of beauty seldom seen in Europe, with high, conical breasts in the women, totally unlike the pendulous negroid udders so common among Gallas and Amharas, and with the characteristically narrow faces and noses typical of the Somali. The other end type is an ordinary prognathous, thick-nosed, wide-eyed negro. About one Somali out of five seems to have a strong strain of negroid blood; in the others it is for the most part dilute. A few individuals among the Somali [69] are lighter skinned, brachycephalic, curly haired, and identical in almost all respects with the typical Hadhramis of southern Arabia. They undoubtedly represent the strain of the missionaries who converted the Somalis to Islam, and who founded the present tribes and families. They are, needless to say, rare.

Among the Amharas there is one very impressive type with a relatively light skin color, a high, wide, sloping forehead, very frizzly hair, a high-bridged nose with a thick, depressed tip, and a long, rather bony face. The total effect is incipiently Papuan, and one feels that a veddoid-negroid cross is indicated, in combination with various amounts of both Arabian and Ethiopian varieties of Mediterranean. The linkage in this type of frizzly hair with these exaggerated facial characters seems to show a genetic realignment of some interest. This type is rare among Hamitic-speaking Ethiopians, who conform for the most part to Mediterranean or negroid facial patterns, in various degrees of solution and in various combinations.

Except for the peculiar behavior of the frizzly hair form among the Amharas, white racial traits, on the whole, seem to be linked together. Among the Somalis, straight or wavy hair is usually fine, inclined to baldness on the head, moderate to heavy on the beard and present on the body; frizzly or woolly hair is of medium texture and scanty on beard and body; curly, Hadhramaut-style hair is often coarse, but is intermediate between white and negroid hair in quantity and distribution. Among both highland Hamites and Somalis, the lighter skins usually go with narrower noses, and straighter hair; dark brown eyes are strongly associated with narrow noses, black eyes with broad ones.

On the basis of these correlations, it is evident that the partly negroid appearance of Ethiopians and of Somalis is due to a mixture between whites and negroes, and that the Ethiopian cannot be considered the

[69] I measured but one, Puccioni gives photographs of several.

representative of an undifferentiated stage in the development of both whites and blacks, as some anthropologists would have us believe. On the whole, the white strain is much more numerous and much more important metrically, while in pigmentation and in hair form the negroid influence has made itself clearly seen. This study of Ethiopians and Somalis has served to bring out the principle that metrical similarities of a racial order have little reference to the soft parts, since Somalis, Gallas, Arabs, Berbers, Norwegians, and Englishmen may all be closely related in measurements, and at the same time fall at world extremes in pigmentation and in hair form. Within the Mediterranean racial family there is every variation in these external features between a Nordic and a Somali.

The northern relatives of the Somalis, the Afar or Danakil, seem to resemble them closely both metrically and morphologically. [70] If one may hazard a guess from inadequate material, they are even less frequently negroid than are the Somali. The Baria and Cunama, the Sudanic-speaking tribes of Eritrea, are of moderate stature, and are small headed; they are a negroid-Hamitic mixture in which the old Sudanese negroid element is strong. [71]

Of great importance from the standpoint of the history of Hamitic-speaking peoples in North Africa are the various tribal divisions of the great Beja people, who live to the east of the Nile from Eritrea north into Upper Egypt. Some of them now speak Tigré, others Arabic, but their original speech is Cushitic, and their racial relationship seems to be with the Somalis and Danakils for the most part. Some of them, such as the Haddendoa, have been largely mixed with Sudanese negroes; the less mixed, such as the Beni Amer in northern Eritrea, and the Bisharin in the Egyptian desert, represent a fairly uniform type which Seligman compares to the predynastic Egyptians.[72]

This type is, in its least negroid form, of moderate stature, with tribal means ranging from 164 to 169 cm., and comparable in head dimensions and in facial and nasal breadths with the Somalis, although some tribes are smaller headed. The characteristic narrow jaw of the Somalis is also typical here. The skin color is usually somewhere between a bronze-

[70] Bouchereau, A., **Anth,** vol. 8, 1897, pp. 149–164.
Santelli, **BSA,** Paris, ser. 4, vol. 4, 1893, pp. 479–501.

[71] Pollera, A., *I Baria e I Cunama.* Pollera's data make both Baria and Cunama leptorrhine, a supposition which his photographs belie. His nasal breadth technique, and his bizygomatic, are both obviously erroneous.

[72] Seligman, C. G., **JRAI,** vol. 43, 1913, pp. 593–705.
See also:
Chantre, E., **BSAL,** vol. 18, 1899, pp. 138–141. Also, résumé in **Anth,** vol. 13, 1902, pp. 122–123.
Murray, G. W., **JRAI,** vol. 57, 1927, pp. 39–53.

like reddish-brown and a light-chocolate, probably in the lighter part of the rather narrow Somali range; the hair, when not frizzly, is sometimes straight but is usually curly or wavy; and the nasal profile is, like that of the Somalis, usually straight. The physical type of the present-day northern Beja of the Egyptian desert does not exactly fulfill the specifications of the peoples who, as we shall see shortly, must have brought Hamitic speech and Hamitic culture into North Africa in antiquity, but it approximates the general racial position of these Hamitic culture bearers. The presence of the Beja and their apparent antiquity indicate that the desert country east of the Nile and west of the Red Sea has long been a corridor for northward movements by people adapted to desert living, just as the Nile Valley itself, in its reaches below Khartum, may have been a corridor for early agriculturalists.

(9) THE MODERN EGYPTIANS

The reader is already familiar with the physical characters of the ancient Egyptians, from predynastic to Roman times. It will be recalled that throughout their pre-Islamic history the Egyptians consistently maintained their affiliation to a central Mediterranean racial type of moderate head size and intermediate stature. Nevertheless there may have been several contributing Mediterranean elements from different sources which together combined to produce the Egyptian population as a whole. It will be recalled that the ruling class in Egypt was often characterized by a Hamitic facial cast, recalling the upper class Somalis and the aristocrats of the cattle-tending tribes of Uganda. The Cushitic element in the Egyptian language had its racial counterpart.

Egypt has never been truly isolated, and has continually drawn to it peoples from other countries. During the Alexandrian period, many Greeks and Jews settled in the Delta, particularly in the new city to which Alexander gave his name, and this metropolis has remained ever since an international settlement. The Arabs, during the seventh century A.D., swept over Egypt and imposed a new language and a new religion, which only a few of the Nile Valley peasants, the ancestors of the modern Copts, were able to resist. Although Coptic speech has passed, like Latin, into the limbo of ritual languages, Coptic Christianity has been preserved until the present day. The Arabs must have introduced their racial increment into the sedentary Egyptian population, but largely in the cities; on the other hand, the Bedawin tribes which pasture their flocks in the deserts and oases on either side of the valley are, anthropometrically at least, purely Arab. [73]

[73] Chantre says that they sometimes marry the daughters of the Egyptian Fellahin. Chantre, E., *Récherches Anthropologiques dans l'Afrique Orientale*, Égypte, p. 172.
See also Chantre, E., **BSAL**, vol. 20, 1901, pp. 127–165.

After the absorption of the Arabs, the Turks settled as a ruling class in Cairo and other cities, and with them Albanians, Circassians, and other foreigners. With the digging of the Suez Canal, Port Said became an international city, with inhabitants drawn from all nations. Meanwhile, thousands of negroes and Abyssinians have been introduced into Egypt as slaves, and few of them have returned home.

All of these settlers in Egypt, from the time of the Jews and the Greeks to the present, have been city people, while the slaves have been used mostly in urban capacities. In Egypt as elsewhere, the country feeds the city with men, and one may expect to find a racial continuity between the landed peasants of ancient Egypt and the modern Fellahin. This continuity should be, and is, as great as that between ancient Mesopotamia and modern Iraq. The Copts, who have lived endogamously ever since the advent of Islam, must be even better representatives of the early Egyptian type than the Moslem peasantry.

In general, the living Egyptian population is probably as tall as or somewhat taller than that of its dynastic counterparts. [74] Mean statures by districts, from the Delta to Assuan, run from 165 to 168 cm., with the mean for the nation somewhere between 166 and 167 cm. There seems to be no consistent difference in regional distribution, except that the townsmen are shorter as a rule than the farmers. In bodily build neither Copts nor Fellahin are especially thin or linear; a relative span of 104 shows a length of arm and breadth of shoulder in excess of most Mediterraneans. The small hands and attenuated extremities of the East Africans are not common here.

The head form is consistent with that of ancient Egypt; cephalic index means of the different districts are consistently dolichocephalic, at the figures 74 and 75; only in the cities of Alexandria and Cairo, and at Assuan on the Sudanese border, does it rise to 76. Individual brachycephals are extremely rare. The head size is considerable, but not excessive; the Coptic dimensions of 193 mm. by 143 mm. represent the groups as a whole, except in the Delta, where breadths run to 145 mm. The vault height, like that of the ancient Egyptians, is moderate, with regional means varying between 122 mm. and 125 mm. [75] The modern Egyptian cranial vault is slightly larger than that of most Mediterranean

[74] Anthropometric data on living Egyptians have been obtained from the following sources:

Chantre, E., *Récherches anthropologiques dans l'Afrique Orientale, Égypte.*

Craig, J., **Biometrika,** vol. 8, 1911–12, pp. 66–78.

Myers, C. S., **JRAI,** vol. 35, 1905, pp. 80–91; vol. 36, 1906, pp. 237–271; ns. vol. 38, 1908, pp. 99–147.

[75] Cephalic index distribution from Myers and from Craig; auricular heights from Chantre, whose technique alone seems to be standard.

Arabs, and consistent with the dynastic Egyptian dimensions and form.

Facially this difference between Egyptians and Arabs becomes more apparent; the bizygomatic diameters rise to means of 137 mm. among some of the Fellahin groups, and the regional nose breadth means are characteristically 35 mm. to 37 mm. In general, the faces seem mesoprosopic, the noses mesorrhine. Mesorrhiny is also found on modern Egyptian crania. The eye slit of the modern Egyptians is especially long, with the excessive biorbital diameter of 93 mm., as compared to 88 mm. among Yemenis.

From the observational standpoint, the faces of Copts and Fellahin vary between two extremes—a narrow face with a slender jaw, thin lips, and a narrow, aquiline nose; and a broader, lower face with a strong jaw, prominent chin, and a straight to concave nose with root and bridge of medium height and breadth, and a moderately thick, horizontal tip. The lips of this second type are usually full, but not excessively thick.

The exposed skin color of the Egyptians has been often described and has been tabulated on the basis of subjective observation, but has not been measured by means of a standard scale. It is the agreement of all investigators that it varies greatly with latitude; that starting with the brunet-white skin of the Delta, which often has a yellowish or honey-colored tinge, it grows darker as one ascends the Nile, so that the characteristic shade of the southernmost districts is a reddish brown to medium brown hue. In all regions, however, it varies from a "very fair," seldom exceeding 2 per cent, to a "very dark," which is presumably a chocolate color. On the whole the Copts are lighter skinned than the Moslems, but this must in a measure reflect occupational differences, since relatively few of the Copts are farmers.

The hair form of the Egyptians varies from straight, which does not exceed 10 per cent, to a close spiral with ringlets of small diameter. The majority are curly in one sense or another; few are frizzly or palpably negroid. Wavy hair is slightly more common in Lower than in Upper Egypt, but not greatly so. The hair is almost always black or very dark brown, but the beard is sometimes lighter; the eyes range from dark brown to light brown, with many mixed or intermediate brown iris patterns. Incipient eye blondism seems limited to 10 per cent or less, and is, of course, commonest in the Delta.

Some 130 miles west of Luxor, in the Libyan Desert, is the beginning of a long geological depression, which contains a number of oases. The easternmost of these is Kharga, [76] which is part of Egypt both politically and historically. The inhabitants of this oasis are isolated from the rest of the world in a general sense, although during the centuries of intensive

[76] This material derived from Hrdlička, A., *The Natives of Kharga Oasis*, Egypt.

slave trading it was frequently visited. There is some question as to whether the inhabitants of this oasis were Libyans or Egyptians in Pharaonic times, but by the Roman period they were considered fully Egyptian. With the introduction of the camel, Kharga became an important station on the Sudanese slave route; sick slaves were left there, and other slaves taken in exchange for animals and food; as a result of this some third of the population now shows negroid traits. That this negroid blood has been acquired wholly since Roman times has been demonstrated by a study of many mummies and skeletons from a large Coptic cemetery in Kharga. None of these show negroid traits either skeletally or in hair form.

The non-negroid Khargans resemble the Fellahin of Upper Egypt in most metrical characters; they are, however, shorter, with a mean stature of 164 cm. Their relative sitting height mean, 51.3, conforms to the usual Mediterranean standard. The heads are somewhat smaller than those of most Egyptians, with length and breadth means of 189 mm. and 141 mm., and are equally dolichocephalic (C. I. = 74.8). The faces are short and of moderate breadth (132 mm.) while the foreheads and jaws, with mean widths of 103 mm., are moderate and typically Mediterranean. The noses are moderately broad (37 mm.) and apparently mesorrhine. [77]

The skin color of the Khargans is said to be lighter than that of the Upper Egyptian Fellahin; characteristically it ranges, where exposed, from a brunet-white or tawny-brown to a medium brown, with lighter colors on unexposed regions. The head hair is almost always black, but the beard often contains lighter individual hairs; the beard quantity is usually slight or moderate. In the individuals who are not otherwise negroid, the head hair tends to be straight or wavy, with a minority of curly forms. If our data are comparable, it is straighter than that of most Egyptians.

The browridges are usually slight, the eyes horizontal, and the nasion depression medium. The commonest nasal profile forms are straight and slightly convex, with concavity rare. On the whole the nose resembles that of the coarser end type of the Egyptian Fellahin. One of the peculiarities of the Khargan group is an incidence of over 20 per cent of noticeable prognathism. Hrdlička finds that despite these close metrical and morphological resemblances between Khargans and Upper Egyptians, it is not difficult to tell them apart, and he attributes this to the lack of a Semitic Mediterranean element in the oasis population. This would imply the absence of an Asiatic Mediterranean strain in dynastic times,

[77] Hrdlička locates nasion at a point lower than would be the case were one to follow the technique considered standard in this work. It must be made clear that his technical usage is not to be considered a "mistake," but rather the result of a difference of opinion.

especially if the early Khargans were Libyans; and the lack of any considerable Arab admixture since the advent of Islam.

(10) NORTH AFRICA, INTRODUCTION

North Africa is today an integral part of the Mediterranean world, but it has not always been so. It is land taken over by Mediterraneans, rather than basic Mediterranean country; for this reason it, like Europe, is racially complicated by the survival of Neanderthal-inspired Upper Palaeolithic food-gatherers. This survival is important only in a few places and among small populations, and in this respect North Africa differs greatly from most of Europe. The Mediterranean inroads began here earlier than in Europe, and since North Africa was the highway over which many of the Mesolithic and Neolithic invasions of Europe passed, it is natural that it should have a more thoroughly Mediterranean complexion.

From the beginning of the third millennium onward, northern Africa enjoyed, throughout Egyptian and classical history, the hazy repute of a region peripheral to great centers of culture. From the beginning of the first millennium B.C., the Phoenician colony of Carthage spread eastern Mediterranean civilization into Tunisia; after the fall of Carthage, the Romans extended the enlightened area to include much of Algeria, while the Greeks had already colonized the coast of Cyrenaica. At the time of the Arab invasions, North Africa was fast becoming a backyard of Europe. The advent of Islam brought this process to a violent end, and it did not begin again until after the conquest of Algeria by Napoleon.

Ever since the earliest notices of North Africans on the Egyptian monuments, the native inhabitants of North Africa have spoken Hamitic languages of the closely knit Libyan family. There is very little dialectic difference between them, and it is possible for a Riffian, for example, to speak with an Algerian Kabyle. Similarly, the Berber speech of the natives of Siwa Oasis, on the eastern extremity of the Berber world, is surprisingly like that of the Braber tribes of the Moroccan Middle Atlas, some 3000 miles distant. When contrasted with the complex Cushitic family of Hamitic speech, Berber appears extremely homogeneous, and we are warned by linguistic principles that its spread over the immense Berber area cannot have been too remote in time. It is possible that earlier Berber languages have disappeared, and that the present ones owe their distribution to a relatively recent diffusion.

There are, however, remnants of pre-Hamitic speech in various parts of North Africa. The Guanche spoken in the Canary Islands, at the time of the Spanish conquest, early in the fifteenth century, was only partly Berber, and contained a large percentage of words of unknown linguistic

affiliation.[78] In modern Riffian and in other Moroccan Berber dialects, there is a residue of non-Hamitic words in the local languages. For example, plant names ending in *-nt* or *-nth* may be seen in the word *iminthi*, meaning barley, and in *shinti*, meaning rye. These words have also been noticed in Indo-European languages of the northern Mediterranean shore, such as Greek and Albanian, and are generally attributed to the so-called Caucasic or Mediterranean linguistic group, which is the B element in Indo-European. It is very likely that agriculture, including the use of these two cereals, was introduced into North Africa by pre-Hamitic peoples.

Although there can be no doubt that Libyan Berber was spoken in the part of North Africa with which the Egyptians were in contact as early as 3000 B.C. and earlier, especially since there is a Libyan element in ancient Egyptian, we cannot assume the same for all of North Africa. It is possible that pre-Hamitic languages were spoken in Morocco and in isolated mountain regions in Algeria and Tunisia until much later, perhaps as late as the time of Christ, since there are strong Riffian traditions of people living in remote valleys who did not speak languages identifiable as *tashilhait*, or Berber.

According to the Arabian genealogies, all Berbers are descended from two men: Berr ibn Branes and Berr ibn Botr.[79] These two Berrs, although possessing the same name, were not related. From them are descended the great families of Berbers such as the Masmuda, Senhaja, and Zenata. Of all these great families the earliest to spread seems to have been the Masmuda or Ghomara branch. This was followed traditionally by the Senhaja, who today include such varied peoples as the Siwans on the borderlands of Egypt, the Tuareg of the Sahara, and the Braber of the Middle Atlas in Morocco. The third great expansion was that of the Zenata, who were known in Roman times in Cyrenaica, but who did not reach Algeria and Morocco until the Middle Ages. In the thirteenth century these Zenata finally invaded Spain, conquering Arabs and earlier Berbers. One may compare the expansions of the Berber families to those of Kelts, Germans, Slavs, etc. in Europe.

[78] Hooton, E. A., *The Ancient Inhabitants of the Canary Islands*, pp. 16–19.
Abercromby, J., **HAS**, vol. 1, 1917, pp. 95–129.

[79] Coon, C. S., *Tribes of the Rif*, contains a survey of some of this material. See also Bates, O., *The Eastern Libyans.*
Bertholon, L., and Chantre, E., *Récherches anthropologiques dans la Berberie Orientale.*
Fournel, H., *Les Berbers.*
Gautier, E. F., *Les Siècles Obscurs dans l'Histoire du Maghreb;* Sahara, the Great Desert.
Gsell, S., *Histoire Ancienne de l'Afrique du Nord.*
The primary sources for this section are chiefly: Herodotus, Sallust, Procopius, el Bekri, Ibn Khaldun, Marmol, Leo Africanus.

Unlike the later writings of mediaeval Arabs, the Egyptian and classical notices of Berbers do not assign to them an orderly descent from a few patrilineal ancestors in a typically Semitic scheme. The Egyptians, throughout their artistic history, took pains to distinguish the Libyans from other peoples by well-defined physical peculiarities. The Libyans are shown as active barbarians, clothed in animal skins, and wearing ostrich plumes in their hair; they are definitely white men, with lighter skins than either Egyptians themselves or Semites. Their faces are usually more sharply cut in profile than those of the Egyptians; the browridges are often prominent, the noses aquiline, the chins pointed, and the beards moderately abundant.

FIG. 38. ANCIENT LIBYAN.

Redrawn from Bates, O., *The Eastern Libyans*, Plate 3, p. 120.

During the Old Empire, the Libyans are depicted as brunets; but in New Empire representations we see a change in the appearance of some of them. One branch, the Tehennu, known to the Egyptians from earlier times, still consists of brunet white men, but another group, the Mashausha, coming from farther west, is definitely blond.[80] These two, the new people and the old, joined forces and attacked Egypt from the west. In dress and in other respects, there is nothing to indicate that the Mashausha were not Libyans.

Herodotus, in later times, places the Maxyces in western Libya, and states that they were culturally different from the purely nomadic Libyans to the east. The continuity of the name *Mashausha* through *Maxyces* extends to *Mazuza*, a sub-tribe of Riffians, and to the term *Imazighen*, by which many of the Berber groups designate themselves, and *thamazighth*, by which they identify their language.

These Maxyces, or Mashausha, as described by Herodotus, Sallust, and others, seem curiously un-African in some respects. They drive about in chariots, drawn by fiery horses; their garments are covered with gold; they sacrifice oxen by strangulation, in a central Asiatic manner; the details of their council form of government, as revealed by a study of its modern counterpart, the *Ait Arbain*, are strangely Altaic.

While it would not be prudent to press this argument too far, it is quite possible that one or more of the invasions of West central Asiatic peoples which reached Palestine during the Bronze Age, or during the

[80] Bates, O., *The Eastern Libyans*, pp. 39–43.
Maspero, G., *The Struggle of the Nations*, p. 431.

time of the earliest use of iron, crossed the Delta into northern Africa and kept moving across a country which offered little feed for cattle and horses, until they reached the Algerian and Moroccan grasslands. Herodotus specificially states that these people were descendants of Persians. In any case, the horse and chariot entered North Africa from the east; either some Libyans took both from the Egyptians and spread them westward, or a specific people brought them in. The hypothesis of an Asiatic invasion of blond horse-users is not necessary to explain the Mashausha, nor the modern incidence of North African blondism, but, as will be seen later, it agrees perfectly with the present distribution of races in this area.

The history of North Africa during the last five millennia, as dimly outlined by oblique literary and artistic references, and in the absence of adequate archaeology, is not as simple a matter as the early Arab historians, who codified Berber tradition in their own pattern, supposed. It appears to have consisted of a succession of invasions of Hamitic-speaking peoples, mostly nomadic, interspersed with various outsiders, and later of Arabs, into the territory of agriculturalists of Neolithic cultural tradition and of basically European racial character. The Ghomara-Masmuda invasion is one of the earliest which may be salvaged from Berber traditional history, and this was followed by that of the Senhaja, and finally by that of the Zenata. Although the main direction of these expansions seems to have been from east to west, from the Hamitic center to its periphery, this is not true of all of them. The Senhaja, in at least part of their history, moved eastward.

In remote parts of Barbary are still to be found clans and families who cannot trace their ancestry to one of these noble Hamitic lines, or to Arabs, but who admit descent from indigenous heathen or from Christians. These families are called by Marmol "Berbers without name," and represent the last survival in mountain communities of pre-Hamitic patrilineal family lines, except in those cases in which descent from Romanized Christians of various origins is indicated. Even in the clans named after Hamites or Arabs, the indigenous blood may be strong through continuous female infusion and through adoption.

The Masmuda and Ghomara, who made up the earliest invasion on record, are said to have come from Rio de Oro, as are the Senhaja, according to one tradition. There is, however, a story in both El Bekri and Ibn Khaldun that Ifrikos, the ancestor of the Senhaja, came from the Yemen, not long before the birth of Mohammed. This curious legend is supported in ways unknown to the Arab historians, for cultural traits diffused by some of the Senhaja-speaking peoples include terraced agriculture with irrigation, high earthen *tigremts* or castles, architecturally

similar to those in southern Arabia, textile techniques, textile designs, and pottery forms and decorations all of which are strikingly similar to those in the Yemen.

The Zenata, who appeared in Roman Africa in the third or fourth century A.D. and did not invade northern Morocco and Spain until the twelfth century,[81] brought with them the camel, which they passed on to some Middle Atlas Braber tribes, who, separately or in combination with them, developed into the Tuareg. These Zenatan invaders were what Gautier calls *les grands nomads chamelliers*, the tall, lean, desert people, riding on camels, clothed in blue, and veiled, who trickled along the northern rim of the desert, and who took from Rome the outlying portions of her African empire.

The introduction of the camel changed profoundly the life of the North African plains, although it had little effect on that of the mountains. The wheel disappeared completely; the barbaric Libyans with their bronze and gold vanished from history, and those of them who were not absorbed by the newcomers and who refused to adopt the new economy took to the hills, to found rustic family lines among the mountain farmers. The camels of the newcomers pulled up the grass by the roots, flayed the trunks of all the trees which they could reach, hastened the process of soil erosion, and made the plains of North Africa at last truly African in appearance.

With the introduction of the camel, however, the Sahara became once more suitable for more than a sub-marginal human habitation. At some time during the late Pleistocene or during the periods of post-pluvial climatic change, negroes and negroids had moved up to occupy the oases and mountains of the northern Sahara, and the southern fringe of the Atlas country. Kufra was a negro oasis until the Arabs took it, and the course of the Wed Dra'a is the home of the Haratin, an insufficiently studied group of negroes. With the camel, white men moved down into the Sahara as swiftly riding nomads, enslaving the scattered groups of local negroes, and bringing others up from the Sudan in slave caravans, to cast a negroid tinge across the racial complexion of North Africa, which had hitherto been wholly white man's country. Most of the slave trading, however, was carried on in Arab times, and indeed, the Arabs arrived in North Africa not long after their most useful animal, the camel.

The Arab invasions of North Africa can be divided into two waves, the first which came directly from Arabia, shortly after the death of the Prophet, and which brought families of aristocratic Arabs from the Hejaz and Yemen. These invaders came mostly without wives, married Berber

[81] As Almohades, or al-Muwaḥḥids.

women, and founded towns and dynasties. Although they converted much of the countryside to Islam, they did not force the Berbers to accept Arabic speech, which was confined, at that time, to the cities. In the eleventh century came the second Arab invasion, which was one of much greater volume and importance. This was the invasion of the Beni Hillal and Beni Soleim, tribes of apostate Bedawin from the Syrian Desert, who had made nuisances of themselves by pillaging caravans. This Hillali element introduced the first numerically important infusion of Arab blood into North Africa. The Beni Hillal and their companions settled first in Cyrenaica; thence some of them moved on to the Algerian plateau country, and to the country just south of the Atlas in the Moroccan Sahara, and onward to Rio de Oro. Other bands passed from Algeria through the Taza gateway down the *ṭrik eṣ-ṣultan*, to occupy the Moroccan plains along the Atlantic coast, from Safi to Tangier, and inland to Fez and Wezzan.

At present the inhabitants of North Africa are about evenly divided between Arabic and Berber speech, with the former commoner in the east, and the latter in the west. Although the Siwans speak Senhajan, the Cyrenaicans, largely Berber in blood, have been Arabized in language. Aside from the Tuareg, who also speak Senhajan, the next most easterly area of Berber speech lies in southern Tunisia and eastern Tripoli. In Algeria Berber is spoken by two important Berber groups, the Kabyles of the coastal mountains east of Algiers, and the Shawia of the Aures Mountains farther south. Oasis people, such as the Mzabites of Ghardaia, are also Berber speakers, as are the inhabitants of the Tunisian island of Jerba. In Morocco Berbers hold more land than do Arabic speakers; the whole northern strip from east of Melilla nearly to Tetwan, is occupied by Riffians and Ghomarans; the whole Middle Atlas by Senhajan Braber, and the Grand Atlas west of Demnat, by Shluh. In the lowlands east of the Middle Atlas, on the Algerian-Moroccan borderlands, and reaching up into the Riffian territory, are tribes of Zenata.

Throughout North Africa there are tribes and confederations of Arabized Berbers, and also some Berberized Arabs. Language and ethnic origins do not always coincide, and North Africa must be studied as a whole. The present North African peoples, apart from Jews and negroes and European colonists, represent a blend in different proportions between descendants of the old Afalou race, the Mesolithic and Neolithic Mediterraneans, the hypothetical central Asiatic nomads who may or may not have brought in the horse and chariot, the Hamitic-speaking tribesmen whose relationships are east of the Nile and in Ethiopia, and the two waves of Arabs. The regional variation between these elements reflects, in the main, varying proportions of the different components.

An exception is seen, however, in the coastal region of Tunisia, where the Carthaginian state had its center, and where there may survive a minor Punic element, and the Islamized descendants of the much more numerous Greek and Italian settlers of the Roman period.

(11) THE EASTERN ARABO-BERBERS, LIBYA, AND THE OASES

The subject of this section will be the population of the eastern part of the Italian territory of Libya, and of Siwa Oasis, which is under Egyptian suzerainty. This population is largely Arabic-speaking, although the Siwans still maintain a Senhajan idiom; the Cyrenaican tribes of Berber ancestry have been linguistically Arabicized. In this territory there are three general classes of people (1) Oasis Berbers (2) Arabized agricultural Berbers, in Cyrenaica and Marmarica, (3) Nomadic tribes, mostly of Arab origin. The third group lives mostly in the hinterland of Cyrenaica, and in the neighborhood of the oases of Awjila and Magiabra.

The oasis dwellers of Siwa and Awjila are so much alike that they may be considered together.[82] In both there is a considerable homogeneity of type, and this type differs little from that described in Kharga, except that here it is more extreme. We have anthropometric data on the stature and bodily segments only from Awjila. These oasis dwellers are short, with a mean stature of 161 cm.; relatively long armed, with a relative span of 105. The shoulders are relatively broad and the legs somewhat short. The Siwans on the whole seem very much the same, judging from descriptions and photographs. Neither of these populations appears particularly well nourished.

The most notable feature about these oasis peoples is their extreme dolichocephaly. The mean for both Siwa and Awjila is 71.7, and in neither group has a single brachycephal been measured. The heads are of moderate size, with lengths of 193 mm. and breadths of 138 mm. The vault height, at least in Awjila, is relatively low, with a mean of 117 mm. On the whole these people are a hyperdolichocephalic and platycephalic group, and stand at an extreme end of the Mediterranean racial range in vault proportions. The faces are both short and narrow, with a mean menton-nasion height of 118 and bizygomatics of 130 mm. in the case of Siwa and 133 mm. in the case of Awjila. The corresponding facial indices are mesoprosopic to mildly leptoprosopic. The noses of these people are mesorrhine, with nasal indices of 70 in the case of Awjila and 73 in the case of Siwa. In both the nose height is approximately 50 mm. and the mesorrhine condition is caused not by the breadth of the nose but by its shortness.

[82] Cline, W. B., **HAS**, vol. 10, 1932.
Puccioni, N., *Antropometria delle Gente della Cyrenaica.*

The hair form in both groups is characteristically wavy. In Siwa, one-fourth of the series is said to have curly to frizzly hair, while the same type is apparently rare in Awjila. Beard and body hair are quite scanty, and the hair color is usually black, but with a very few individuals in Siwa classified as dark brown. The eye color is dark brown in three-fourths of the Siwans examined, and the incidence of eye blondism totals only 9 per cent in the Siwan group, while there is no evidence of it whatever in Awjila, where the eye colors include both dark brown and light brown. In hair and eye color, then, the oasis people are unusually brunet for North Africans. The skin color of both these oasis populations is likewise on the brunet side. In Siwa it falls for the most part between the von Luschan #12 and #15, which is a dark brunet-white or a light brown, and 10 per cent of the group has pinkish-white skin. In Awjila it runs from #16 to #24, and is often a medium brown.

In both these groups straight noses are commonest, but nasal convexity is very frequent, and concave forms are rare. The roots are of moderate height, but with a tendency toward broadness, and the bridge is moderately high and moderately broad. The tips are of medium thickness with medium or slightly flaring wings, and the nasal tip is usually slightly elevated. One of the most characteristic features of the nose of the Siwans, and of the Awjila people, is a considerable nasion depression. The browridges, however, are usually absent or slight, and the forehead slightly sloping to straight; in some cases bulbous.

The chins are frequently receding and the jaws narrow. The mean bigonial diameter of 99 mm. among Siwans indicates the extreme narrowness of jaws among these people, which, however, does not reach a Somali extreme.

On the whole the evidence from these oases, when combined with that from Kharga, demonstrates that the eastern Libyan peoples of antiquity included an oasis dwelling branch of an extreme Mediterranean type characterized by small stature, extreme dolichocephaly, a low cranial vault, a short face, and a mesorrhine nose. This type, while well-characterized today, cannot be identified with any hitherto studied skeletal Mediterranean sub-race, although it appears closest to the small-sized, mesorrhine or chamaerrhine Mediterranean type which reached southwestern Europe during the Mesolithic or as a Neolithic advance guard, and which is best represented by the cranial series from Chamblandes.[83]

The inhabitants of the oasis of Magiabra, adjacent to Awjila, belong partly to the same type, but differ in having a higher cephalic index, their mean being 75.5, and also in possessing the taller stature of 164 cm.

[83] See Chapter IV, p. 115; also Appendix I, col. 14.

Certain Marabutic tribes, who live on the outskirts of these oases and who are of palpably Arab descent are much taller, with a mean stature of 168 cm. and are dolichocephalic (C.I. = 74).

In the agricultural regions of Marmarica and Cyrenaica, the Arabo-Berber tribesmen present a variety of physical types. On the whole they are a moderately tall group with tribal stature means ranging from 166 to 171 cm. As with the oasis people, their characteristic hair form is wavy, and curly forms are relatively rare. The hair is mostly black, but brown hair rises to 20 per cent among certain tribes, and the mustaches are often lighter. This hair blondism is particularly prevalent along the coast. The skin color is a dark brunet-white, usually between von Luschan #12 to #18, but the range is considerable. The fairest skin is again found coastally. Light brown is the commonest eye color, but 33 per cent show some evidence of eye blondism. All of these people are dolichocephalic with cephalic index means ranging from 74 to 77. They are all long faced, and all leptorrhine. Considerable differences are found in their facial features, and in order to discuss these it will be best to describe some of the principal types under which this population falls.

Relatively rare is a thick-set type with a large head, a square, low face, retreating forehead, heavy browridges, deep nasion depression, and a rather short and wide nose with a straight or concave profile. This type is not negroid, but is reminiscent of the Afalou type found in the Upper Palaeolithic remains of Algeria, and seems to be the oldest indigenous racial element. An ordinary Mediterranean type is also distinguishable, with a straight or slightly sloping forehead, moderate browridges, and a straight nasal profile. This Mediterranean type frequently shows an admixture with the first type, and this influence is evidenced by a rectangular facial contour and a considerable width and prominence of the gonial angles.

A third type, which seems to be of considerable numerical importance, is either Near Eastern or East African in affinity, or both; its diagnostic features are a receding forehead, a high vault, small or absent browridges, a minimum of nasion depression, and a long arc-shaped convex nose. This type must be ancient in Cyrenaica, for it is commonly represented as a standard Libyan type on Egyptian monuments. Now and then one encounters individuals with extremely long, narrow faces and vaults, with straight foreheads and straight noses, who look like the non-negroid end type of the Somalis. Persons who give the impression of being largely Nordic are not common, but may occasionally be observed.

Apparently pure northern Arabian Bedawin features are not infrequent, but the Arabs in North Africa, from Cyrenaica to Morocco, are tall; since they are taller than most Berbers, it is unlikely that this elevated

stature was acquired since their arrival. There are a few brachycephals in Cyrenaica, living in the coastal villages, and these appear to be Dinarics or Armenoids; neither of these racial types, however, has an important part to play either here or in most other sections of North Africa. Cyrenaica, with its medley of Mediterranean and pre-Mediterranean forms, serves as a fitting threshold to the study of North African races.

(12) THE TUAREG

The most specialized, next to the Riffians the most famed, and at the same time probably the least well-known of all North African Berber groups is that of the Tuareg, a conglomeration of nomadic tribes dominating the caravan routes and the few cultivable plots of land lying between the Libyan Desert and Rio de Oro, and between the Algerian oases and the Niger. Some indeed, live in the Aïr plateau on the southern side of the Niger. Despite the vastness of their territory, the Tuareg are not numerous, since their habitat will support but a minimum population. They are divided into two free classes, the *Ihaggaren*, or nobles, the *Imrad*, or tribute-paying tribesmen, and slaves. The nobles ride about on their camels policing this territory, protecting their *imrad*, and pillaging those of other tribes, taking toll of the caravans which pass through their country, and themselves raiding and transporting slaves.[84]

The social system of the Tuareg [85] is a finely balanced response to their environmental needs, and resembles that of the northern Arabian Bedawin in its high evaluation of self-reliance and independence of action. The nobles maintain their superior position by protecting their dependents and by their willingness to fight; with this attitude is connected the concept of racial purity, which in effect makes the physical type of the Tuareg nobles a result, in part, of their social system. Inheritance of rank among the Tuareg passes through the mother, and the numerous mixed offspring of Tuareg men and slave concubines are not given noble rank. Despite the close association between the Tuareg and the negroes, who preceded them in the Sahara and with whom they are in close contact in Nigeria, the noble class has to a large extent preserved its freedom from negroid admixture, although there are many individual exceptions to this rule. The *imrad* are in some cases fully white, and individual *imrad* may be found who are less negroid than individual nobles, but the reverse, as a

[84] The tense used in the above sentence and in the following paragraph is the ethnographic present. Actually, the Tuareg have largely ceased these activities, under French military pressure, and are now faced with the problem of making a new social and economic adjustment, no easy task for a people so specialized and so finely adjusted to an extreme environment.

[85] Sources on Tuareg culture are: Duveyrier, H., *Les Touareg du Nord;* and Benhazera, M., *Six Mois Chez les Touareg du Ahaggar.*

rule, is true. The Tuareg have a definite standard of masculine beauty, a well-recognized noble physique and cast of countenance, which undoubtedly has been crystallized by centuries of selection.

The physical type of the non-negroid Tuareg nobles, and of the *imrad* who are white, is, thanks to a number of anthropometric studies,[86] well enough known to merit accurate description. Since the Tuareg males are never seen without their face-coverings, an accurate knowledge of their characteristic physiognomy is limited to a few scientists who have literally succeeded in lifting the Tuareg veil.

The Tuareg nobles are tall men, with mean statures running tribally from 172 cm. to 178 cm.; about 174 cm. would be their total mean. They are lean, long-armed, and long-legged, with narrow shoulders, narrow hips, and chests which are narrow in an antero-posterior direction; their hands and feet are long and very narrow, their fingers long and thin. The very fine wrists and ankles which we have observed among the Somalis are also present here. The addition of Negro blood to this Tuareg bodily type broadens the shoulders, shortens the legs, and makes the hands and feet wider and larger. The Tuareg relative sitting height mean of 49, indicating that the sitting height is less than half the stature, serves to illustrate the extremely linear constitutional type of this people.

The heads of the Tuareg are dolichocephalic and large; tribal means in the cephalic index vary between 72 and 75, but 73 is the central point of the whole. No brachycephals are found among the white nobles, although they occasionally appear among negroids of other classes. The head length mean for a series of 75 Tuareg nobles is 195 mm., the breadth 146 mm.; the vault is apparently also high. The faces are both long and moderately broad, with a mean menton-nasion height of 126 mm.,[87] and a bizygomatic of 136 mm. The upper face height (72 mm.)[87] is moderately great, and the mandible less shallow than with most Mediterraneans; the foreheads and jaws are said to be narrow. Among selected groups of unmixed nobles, the nasal index means run as low as 62 and 63; among nobles in general, 67 or 68[87] is a commoner figure.

The skin color of the Tuareg is difficult to determine, since they do not wash, and indigo runs from their garments. But when cleaned, the unexposed skin of the non-negroid nobles and *Imrad* is seen to be a brunet-

[86] Benoit, F., and Kossovitch, N., **CRSB**, vol. 109, 1932, pp. 198–200.
Leblanc, E., **RDAP**, vol. 38, 1928, pp. 331–357; vol. 39, 1929, pp. 19–24.
Leblanc, E., and Bercerot, J., **RDAP**, vol. 46, 1936, pp. 140–150.
Verneau, R., **Anth**, vol. 27, 1916, pp. 47–95, 211–242, 406–430, 539–568.
Zeltner, F., **Anth**, vol. 25, 1914, pp. 459–476; **RDAP**, vol. 25, 1915, pp. 170–173.
A craniological study is: Leblanc, E., **RDAP**, vol. 39, 1929, pp. 351–363.

[87] Adjustments and recombinations of different sources, and substitutions for questionable techniques, have been employed in arriving at these figures. The results are, I believe, reliable.

white, without brownish tinge; the mixed bloods, however, who are predominantly Tuareg and only in a minor degree negroid, assume a constant and characteristic dark brown color, known in North Africa as *amrani*, and comparable to the characteristic hue of the Somalis. Mixed bloods of the Ifora Tuareg of the southern Sahara have a reddish-bronze color, foreign to the northern Tuareg hybrids, and due, in all probability, to mixture with Hausa people in the Nigerian plateau of Aïr.

The eyes of the Tuareg are all brown; not a single light or mixed eye has been reported by competent observers; the blue eyes attributed to the Tuareg by travellers cannot be supported by anthropometrists. The characteristic Tuareg eye color is actually a very dark brown, verging on black. The hair likewise is black, and no evidence of hair blondism has been statistically reported from the noble group. The hair is straight, wavy, or curly with ringlets; frizzly hair among the Tuareg is considered a negroid diagnostic.

The classical Tuareg noble, an ideal type to which many of them, as a matter of fact, belong, has a narrow, high, and but slightly sloping forehead; there are no browridges or very slight ones. The face takes the form of an attenuated pentagon, with the base aloft; prominent malars, a narrow jaw, and a pointed chin produce this form. The unmixed Tuareg are orthognathous, have thin to medium lips, and small teeth, which in older people are often worn to the gums. The nose, which is the most characteristic Tuareg feature, is high-bridged, narrow-rooted, and often convex in the upper segment, while the lower or cartilaginous part is straight, thin-tipped, and depressed at the end, with small wings and oblique, highly excavated nostrils.

In mixed forms, which in the lower Tuareg classes are more numerous than the pure noble strain, the stature tends to be lower, the shoulders broader, the head vault wider and lower, the forehead and mid-face broader, and the nose thicker tipped, with wider wings.

The Tuareg in their pure form belong to a specialized Mediterranean sub-type, the creation of which is partly a matter of isolation and selection under extreme environmental stimuli. They resemble the East African Hamites very closely, and especially the whiter element among the Somali, but in their extreme stature and great head size they seem closer than most other living Mediterraneans to the pre-Neolithic East African men.

Tuareg history does not support the view that they represent a survival in isolation of a pure East African strain from a remote period. Their own traditions trace the nobles and *Imrad* to two ancestresses, Tin Hinan [88] and Takamat, who came from Tafilalet and who were Braber,

[88] This ancestress was apparently a real person. The tomb traditionally associated with her name has been excavated and found to contain a female skeleton, richly equipped.

or Moroccan Senhaja. The Braber ancestry cannot, however, be the only factor in the genetic composition of the Tuareg; their use of the camel, and their general manner of living must be ascribed to Zenata from Cyrenaica, who probably contributed largely to the ancestral strain. It is more than likely that a number of Berber families participated in the rapid adaptation to desert life which the Tuareg ancestors must have undergone in the early centuries of the Christian era.[89] It must be remembered that the chief contacts of the Tuareg with settled lands have been with the Sudan rather than with the north, and that the non-negroid elements in such peoples as the Fulah and Hausa must have been Hamitic in an East African sense. The Tuareg probably represent in a general way the ancestral physical type of the bringers of Hamitic speech to North Africa, but their adherence to this type must be a matter of recombination and selection. They are by no means typical Berbers, but may be taken as an end type in the Berber racial complex.

(13) EASTERN BARBARY, ALGERIA, AND TUNISIA

The population of Algeria and Tunisia, apart from the numerous European colonists who have settled there during the last hundred years, and from the Jews who have lived in the cities for a much longer period, is varied and complex in the cultural and linguistic sense, as well as racially. In this section it will not be possible to cover each tribe or even each group of tribes, but it will be necessary to select representative peoples for special consideration.

Any division of this population into segments must needs be arbitrary, but it must be segmented if it is to be discussed simply. With this warning, we shall proceed to divide it as follows:

(1) Mountain Berbers, terrace agriculturalists; perhaps the oldest and most stable element in the population.

(2) The Berber-speaking oasis people of Ghardaia, Tidikelt, Biskra, etc. A special group culturally, and belonging to the schismatic religious sect of Kharejites, or *Khawarij*. To these may be added the inhabitants of the Isle of Jerba.

(3) The Arabic-speaking tribesmen of the more arid plains and plateaux; pastoral nomads or transhumants for the most part.

(4) The townsmen. A mixed urban population of diverse origin, differing in each locality; the pre-Arab Christian population of partly European origin is responsible for certain elements in Tunisia; converted Jews have founded the important commercial

[89] Comparable to the rapid convergence of American Indians from many quarters to the western plains with the acquisition of the horse, and the equally rapid development of a characteristic Plains culture.

families in some cities; negro slaves, Christian slaves, Turks, and wanderers of all sorts have all contributed to the general complexity. A racial study of townspeople by social levels, here as well as in Morocco, would be interesting, but remains to be made.

Of these four elements listed above, I propose to discuss only the first in any detail. Hence it will be better to deal at once with the second and third. The oasis Berbers, who live in compact villages and are noted for their endogamy and clannishness, have a reputation in North Africa for sharpness in money matters, and this is especially true of the Beni Mzab of the oasis of Ghardaia.[90] The Mzabites form a caste of shopkeepers, setting up booths in the markets of most of the towns and cities of eastern Barbary, associating only with their compatriots, and returning to their oasis to retire and marry once their fortunes are made. In this respect they resemble the Hadhramis in the East Indies, the Greeks who come to America from the neighborhood of Sparta, and the Cantonese.

The Mzabites are short men, with a mean stature of 162 cm., relatively wide-shouldered and long-armed, with the unusually high relative span of 106. They are almost exclusively brunet, with less than 5 per cent of incipient blondism in either hair or eye color. Their hair is characteristically black or dark brown, their eyes include both dark and light brown shades, and many irises which fall between the two brown extremes. In bodily size and proportions, and in pigmentation, they resemble the oasis people of Libya, from Kharga to Awjila. They differ, however, in head form, for the mean cephalic index of Mzabite males is 77.3, in the low mesocephalic category. The normal range of this index is from 71 to 85; there may have been originally both a dolichocephalic and a brachycephalic element involved, but the present type, whether or not the result of a blend, is definitely mesocephalic. The face is moderately narrow (133 mm.) and the nose is leptorrhine and absolutely long. The Berber inhabitants of Biskra Oasis[91] resemble the Mzabites closely in measurements and in pigmentation. The hair form of these latter, and probably of the Mzabites as well, is usually straight or slightly wavy.

A closer approach to true brachycephaly is found among both the Berber-speaking and Arabic-speaking Kharejites of Jerba, who resemble the more brachycephalic element among the Mzabites. The Jerbans are of medium stature (165 cm.), and are often of a stockier bodily build than is usual in North Africa.[92] Their mean cephalic index, 80.8, is

[90] Amat, C., **RDAP,** ser. 2, vol. 7, 1884, pp. 617–639; *La Mzab et les Mzabites.*

[91] Topinard, P., **BSAP,** vol. 5, ser. 2, 1870, pp. 548–555.

[92] Benoit, F., and Kossovitch, N., **CRSB,** vol. 109, 1932, pp. 198–200.
Bertholon, L., **Anth,** vol. 8, 1897, pp. 399–425. Also
Bertholon, L., and Chantre, E., *Récherches anthropologiques dans la Berberie Orientale,* pp. 175–176.

actually sub-brachycephalic, and in one tribe, the Beni Maguel, it rise to 82. These Jerbans are longer and narrower faced than most othe North Africans (F.I. = 93.8) but at the same time are not as narrow nosed (N.I. = 70.6). Their typical head form is globular, with a prominen forehead equipped with frontal bosses, and a slightly flattened occiput They are markedly brunet, with only two partial blonds in a series of 148

Facially, the Mzabites and Jerbans show a smoothness of feature and a lack of bony prominence, combined with a frequent convexity of th nose, which gives them a characteristic appearance which renders then easily recognizable. The Algerian and Tunisian Kharejites, whethe living in oases or on an island, seem to be related to or similar to th oasis people farther east, with the addition of some brachycephalic o brachycephalizing factor which is strongest among the maritime Khare jites, and which cannot be explained on the basis of present information It is tempting, though unprofitable, to suspect the early accretion o an exotic, sea-borne brachycephalic element, such as that found among the maritime people of the Arabian coast. Whatever the origin of thi element, which does not appear to be native to North Africa,[93] endogamy and the following of specialized hereditary trades must have been impor tant factors in the stabilization of the Kharejite type or types.

Division number three of our list, the nomadic or semi-nomadic Arabic speakers of the plains and plateaux,[94] is comprised of numerou tribes partly or wholly of Arab origin; some of them, however, must b nothing more than Arabized groups of Zenata and Senhaja. They ar all, or nearly all, tall people, with stature means in the neighborhoo of 170 cm.; they are dolichocephalic or mesocephalic, and leptorrhine with a tendency to strong nasal convexity and high, sloping foreheads Among them may be seen members of various Mediterranean sub-races including chiefly Atlanto-Mediterranean and what appears to be Irano-Afghan. Smaller Mediterraneans are not infrequent, and one sees among them an occasional Nordic or near-Nordic.

The mountain agriculturalists are best represented by two groups o tribes, the Shawia and the Kabyles, the former living in the Aures Mountains south of Constantine, and the latter in the coastal Djurjura immediately east of the city of Algiers.[95] Both of these Berber groups are noted

[93] The Jerbans possess a number of exotic cultural traits, such as dog-eating, the drinking of palm toddy, etc.

[94] Based on Bertholon and Chantre.

[95] Besides Bertholon and Chantre, the chief sources are:
d'Hercourt, G., **MSAP**, vol. 3, 1868, pp. 1–23.
Malbot, H., and Verneau, R., **Anth**, vol. 8, 1897, pp. 1–18, 174–204.
Papillault, G. F., **BSAP**, ser. 4, vol. 8, 1897, p. 538.
Randall-MacIver, D., and Wilkin, A., *Libyan Notes*.
Viré, A., **BSAP**, ser. 4, vol. 4, 1893, p. 71.

(*Continued* on page 477.)

for their European-like features and fair skins; blondism of a high order is frequently attributed to them in the non-statistical literature. Both of them contain a minimum of Arab blood, and of the brunet Mediterranean strain or strains which may have been associated with the introduction of Hamitic speech into North Africa.

The notable fact about the Shawia is that, in a metrical sense, they are identical with northwestern European Nordics. One could substitute the means of the Shawia sample of Randall-MacIver and Wilkin for those of a characteristic eastern Norwegian province without serious discrepancy.[96] This is true of stature, relative span, and relative sitting height, as well as of the principal dimensions of the head and face. The only difference of any importance is that the minimum frontal (106 mm.) and the bigonial (105 mm.) of the Shawia are both a little wider than those of the European Nordics—that they diverge from the Nordics in a non-Mediterranean direction and in the direction of the population of western Norway.

Although the Shawia are so Nordic anthropometrically, and although they are characteristically white skinned, they are for the most part brunet in hair and eye color. Only some 30 per cent have mixed or light eyes, and 96 per cent are listed as having black head hair. The nasal profile shows Nordic tendencies; concavo-convex forms, like those common in England, are as frequent as straight, and together account for half of the whole; convex profiles are more frequent than concave, which are found among one-sixth of the group. Against the prevailing brunetness of the Shawia stands the tradition that their ancestors were formerly much blonder, and that their present brunet condition is due to mixture with outside Berber and Arab groups. This statement, however, belongs to the class of evidence which cannot be proved. Since the available series of Shawia do not lend themselves to serious analysis, the anthropometrically Nordic condition of this people cannot be discussed profitably here; there are other such populations in North Africa which have been more extensively studied, and which will be dealt with shortly.

The Kabyles of the Djurjura Mountains cover a considerable area, and probably vary regionally, as differences between various series

Weissgerber, H., *Les Blancs d'Afrique.*

Also an unpublished series of 304 adult male Kabyles, measured at Tizi Ouzou by H. H. Kidder under the auspices of the Division of Anthropology of Harvard University.

[96] The same is true for the series of Papillault and of Bertholon and Chantre, except for a few technical discrepancies. Randall-MacIver and Wilkin find a total face height mean of 120.95 mm. for the Shawia, and a nose height mean of 51.35 mm., both indicating a low location of nasion. Since Bryn also locates nasion low in his *Somatologie der Norweger*, the comparability of the two is not impaired.

would indicate.[97] Some are very much like the Shawia, but those coming from the neighborhood of Tizi Ouzou [98] are shorter statured and smaller headed. They are, in fact, so constituted anthropometrically that they serve as an excellent example of a centrally placed early Mediterranean racial type, with certain modifications.

The stature of this group is moderate (164.6 cm.), the bodily proportions the same as those of the Shawia, and of most Nordics; at the same time comparable to those of Plateau Yemenis in Arabia. The light mean body weight of 124 lbs., with the heaviest man only 190 lbs., is typically Mediterranean. The head length, however, which varies from 161 mm. to 211 mm., has a mean of 187 mm., while the breadth falls at 145 mm., with a cephalic index mean of 77.6. This index ranges from 68 to 91, indicating a great variety of head form. The vault height of 127 mm. completes the parallel between the mean of this variable group and the Yemenis. In facial dimensions the Kabyles are good Mediterraneans, except for an excess in forehead and jaw widths, in which they equal the Shawia. In having an upper facial height mean of 73.7 mm., as compared to the total face height of 122.4 mm., they are typically Mediterranean as opposed to Nordic. Except for forehead and jaw breadths their anthropometric position on the whole lies with not only the Yemenis but also with the predynastic Egyptians.

Their pigmentation is characteristically brunet, but definite blonds occur. Black and dark brown hair run to 85 per cent of the whole, while reds number 4 per cent. The eye color is light or mixed in but 16 per cent of the group; the rest are evenly divided between dark brown and light brown. The skin color, observed on exposed parts only, is definitely dark in almost all instances; while the unexposed skin is undoubtedly lighter, the low incidence of freckling (9 per cent) would argue against much extreme lightness of skin color. There is, without question, a numerically minor blond element submerged in the brunet Kabyle mass, as exemplified by this series, but it is relatively insignificant.

The hair growth is usually dense on the head, with little baldness, and relatively sparse on the beard. The hair is, in the majority of instances, straight or wavy, with a 23 per cent incidence of ringlet curls, and 12 per cent of individuals showing what may be presumed to be a negroid hair form. The texture of the hair is usually medium. In these pilous characters, the group as a whole agrees with a normal Mediterranean classification, with evidence of a negroid tendency in a minority of cases.

[97] Randall-MacIver and Wilkin, d'Hercourt, Viré, and Kidder. Since Kidder's series is the most extensive, it is the one chiefly used here.

[98] Principally from Bellora, Beni Sirenzer, Ma'akta, and Sheikh Ou Meddour.

The Kabyles lack, for the most part, either internal or external eye-folds, but one-fifth of the sample shows median folds, which indicate a low orbit, and may be a reminder of the old Afalou race. The eyebrows are typically and almost exclusively medium in thickness, lacking in concurrency, and relatively great in lateral extension. Thus the bushiness and concurrency of the eyebrows common among Asiatic Mediterranean varieties hardly exist here.

In the conformation of the Kabyle face, in contradistinction to the metrical variability of the vault, there is a considerable homogeneity, and a characteristic type to which the majority of Kabyles conform. The glabella is moderately developed and heavy browridges are rare; the forehead is usually straight or only slightly sloping. In the nasal observations, almost all of the characters tabulated exhibit an intermediate position in regard to the total white racial group. The root of the nose, set at a moderate depth below glabella, is of slightly more than moderate height and breadth; the bridge tends to slightly more than medium height and breadth. The profile is usually straight, with a strong minority of concave and concavo-convex forms. The tip is moderate in thickness; the wings are of medium lateral extension, and rarely flaring. The septum is usually straight, and inclined upward in nearly two-thirds of instances. On the whole, the Kabyle nose shows little or nothing of a high-rooted, beaky Near Eastern quality, and less that can be called negroid. It is, on the whole, an average Mediterranean nose.

The lips are, for the most part, on the thin side of medium; prognathism of any kind is almost completely absent, the chin prominence is average for whites, and malars and gonial angles, which give prominence and detail to the face, are on the strong side of medium. The square-faced condition so often noted among Berbers is present in a minority of this group. Lambdoid flattening, which with a great jaw breadth is a diagnostic of the old Afalou race of Algeria, is present in 50 per cent of the group; but it must be remembered that it is not entirely lacking among pure Mediterraneans.

On both anthropometric and somatoscopic grounds, one is led to the conclusion that the Kabyles represent a conglomerate survival of several of the more ancient North African racial elements; the major one is a central Mediterranean, with a slight negroid tendency or accretion; and this Mediterranean dates back to the days of Early Neolithic agriculture in North Africa. With it also survive traces of the Afalou men, whom we shall see in greater strength farther west, and some of whom show a tendency to brachycephaly; and of Nordics, whenever and however they may have appeared in North Africa.

(14) WESTERN BARBARY; MOROCCO AND THE CANARY ISLANDS

Morocco contains the largest number of Berbers of any North African country, both absolutely and relatively; 60 per cent of her population is Berber-speaking, as compared to 33 per cent in Algeria. The Moroccan Berbers are mostly mountain people, while the plains are occupied by Arabs. The road from Oujda, on the Algerian border, to Taza and Fez, separates the Berbers into two groups, who diverge to the west with their mountain chains. The North Moroccan Berbers include the Riffians, the Senhaja Sghir (a group of tribes of Senhajan origin living in the highest mountain nucleus of the Riffian chain), the Ghomara, and the linguistically Arabicized Jebala and Anjera. The southern group includes, on the northeast, the Braber, a group of Senhaja tribes of sheep-herders and horsemen, partly agricultural, living half the year in great castles, and the other half in tents; and on the southwest, the Shluh, Masmuda tribesmen, who are fully sedentary, and live on both slopes of the great Atlas, and in the Wed Sous.

The Riffians, the best known of the Moroccan Berbers, are sedentary agriculturalists, with the exceptions of two tribes, the Metalsa and Beni Bu Yahi, who live in the Garet Desert through which the Muluya River flows. They are the blondest and most Nordic of the Berbers, and have received much acclaim for their warlike ability. They are not, however, of homogeneous ethnic origin.[99] In some tribes the leading families claim descent from Senhaja, others from Zenata, while families of sherifs are, of course, of saintly Arab origin. Families in the central Rif, such as the Beni Khattab, the clan of Sidi Mohammed ben Abd el Krim, are descended from the eighth century Arab missionaries who founded the Kingdom of Nekor in the coastal section of what is now the tribe of Beni Urriaghel. The tribes of purest Riffian descent, who admit indigenous heathen lineage in many families, are the Beni Urriaghel, Beni Amart, and Gzennaya. These form a cultural nucleus in the country back of the Bay of Alhucemas.

Although the tribes are not uniform metrically in a strict sense, they are all moderately tall, all dolichocephalic, all high-headed, and all leptorrhine. The mean stature of the Riffian nation is 168.6 cm.; the tribes vary from 166 cm. to 172 cm. Bodily proportions are on the whole

[99] Both the cultural and anthropometric material in this section which deals with Morocco are derived from Coon, C. S., *Tribes of the Rif.*

Other sources are:

Benoit, F., and Kossovitch, F., **CRSB,** vol. 109, 1932, p. 198. This contains data on four constants for 4238 Moroccan Berbers, treated as a single group; also Kossovitch, N., **ZFRK,** vol. 1, 1935, pp. 134–136.

Kossovitch, N., and Benoit, F., **Anth,** vol. 45, 1935, pp. 347–363.

lean and spare, with a relative sitting height of 50.9, and a relative span of 104. The shoulders are moderately broad, the hips narrow. There is a type of Riffian with a lateral body build, a long trunk, and wide shoulders and hips, but this type is in no tribe numerous enough to influence the mean of the whole.

Absolute head size among Riffians reaches European proportions; the three major head dimensions are 195 mm. by 146 mm. by 129 mm. The mean cephalic index of the whole group is 75, with tribal variations running from 73.5 to 75.8. Very few Riffians are actually brachycephalic. Heads which are large in one dimension are usually large in the others; variation individually and tribally is more in size than in shape. In one tribe, Beni Said, the bulk of the series is composed of the *imgharen*, or members of the tribal council which was in session on the day of measuring; the heads of this august group have the remarkable dimensions, for North Africa, of 197 mm. by 148 mm. by 131 mm. To equal these diameters one would need normally to go to western Norway, to Ireland, or to the United States Senate. Some tribes have much smaller vaults, however; for example, Targuist, with 192 mm. by 144 mm. by 127 mm., has more typically Mediterranean or Nordic dimensions.

The faces of the Riffians are, as a rule, of moderate size; the total face height mean of the whole group is 124 mm., the bizygomatic 136 mm.; the minimum frontal and bigonial are both 106 mm. Tribally, the heights vary from 121 mm. to 131 mm.; the bizygomatics from 133 mm. to 140 mm.; the minimum frontal from 104 mm. to 109 mm.; and the bigonial from 104 mm. to 108 mm. The longest faces go with the tribesmen of the eastern Rif, who claim Zenatan ancestry; the shortest ones with the central tribes of purest Riffian tradition. The facial indices of these latter are mesoprosopic, the others leptoprosopic. The noses are largest and most leptorrhine (61–62) in the east, and smallest and least leptorrhine (64–65) in the west.

The Riffians are pinkish-white skinned, like northern Europeans, in 65 per cent of the total group, and in approximately 80 per cent in the central tribes. The exposed skin color is brick-red in many cases, being incapable of tanning; in others it is brunet-white or light brown in summer, and bleaches out again in winter. Freckles are found on 23 per cent of Riffians; this figure is approximate since some were measured in winter, others in the summer. The head hair is black in 44 per cent of the total, and dark to medium brown in 46 per cent; the others are reddish-brown or light brown; in a few cases, golden-blond. These last form less than 1 per cent of the whole, however. The beard is usually much lighter, being black in only 34 per cent of the total, dark or medium brown in 25 per cent, reddish-brown in 14 per cent, light brown in 19

per cent, and golden, ashen, or red in 8 per cent. Seventeen per cent of Riffians show some rufosity in beard color. Since the Riffians wear turbans, and since the few adults who still wear pigtails cover all but the ends of these, it is the beard color and not the head hair color which is responsible for the current idea of Riffian blondism. Furthermore the children, who go bareheaded, possess an infantile dominance of blondism, as among Europeans of mixed pigmentation. The blondest hair and beards are found in the central Rif, especially in the tribe of Beni Amart, where over 50 per cent of the men have beards light brown or lighter.

Fifty-seven per cent of Riffians have mixed or light eyes; of the remaining 43 per cent, dark brown is the commonest color. Green-brown is the commonest mixed form, then gray-brown and finally blue-brown; pure blue eyes account for only 2 per cent of the group, while only one man was observed with gray eyes. Unmatched eyes are common. In some tribes as few as 20 per cent are pure dark-eyed, in none more than 55 per cent. On the whole, blondism is strong in the Rif; over half of the adult men show some trace of it. But the Rif is not a blond country in the sense that Norway, Sweden, Finland, or even England are blond; it is, however, blonder than most of Spain or southern Italy.

The morphological features of the head and face vary tribally in the Rif, as well as individually; there is no such thing as a typical Riffian. The hair form, however, is in all tribes wavy to ringlet-curly; it is never frizzly except among blacksmiths and other outsiders who are negroid, and who enter the Rif as tradesmen, to go out again when they have made enough money. The Riffians have as heavy beards as northwestern Europeans, and as heavy body hair in most cases; baldness, however, is rare.

Facially there are several well-differentiated types which can best be described separately. One is a long-faced, hook-nosed brunet or mixed pigment type commonest in the east, especially among the Nomads; this physiognomy is considered by the Riffians to be an importation of Zenatan or Arab inspiration. Another is a classic Mediterranean, with slightly sloping forehead, straight nasal profile, slightly elevated tip, moderate nasal wings and oval facial contour; this type is usually brunet; it is found everywhere, but especially in the central and western tribes. A third is a Nordic in the strictest morphological sense, usually with brown hair and mixed eyes, and a Riffian Nordic could be mistaken for an Irishman or an Englishman, less easily for a Scandinavian.

A fourth is a large-bodied, large-headed type, tending to mesocephaly, with a prominent lambdoid flattening especially visible when the scalp is shaven; the face is broad, the orbits low, as one can easily discern from the narrow palpebral opening and the presence of median or external eyefolds; the nose is short, straight, or sometimes snubbed, the mouth

large, the chin prominent, and the jaw heavy. The pigmentation is usually mixed, with brown or reddish hair, and light-mixed eyes. This type, without further discussion, is obviously a somewhat reduced modern survival of the old Crô-Magnon-like Afalou men. It is found principally among the oldest Riffian families, and among tribal office-holders. It is not rare in the Rif, and its reëmergence parallels in a minor sense the reëmergence of the same or a similar type in northwestern Europe.

A smaller variant of this is considered by the Riffians themselves typical of the mountain Beni Urriaghel; short-statured, broad of build, with short, broad hands, freckled skin, reddish beard, bluish eyes, a short, wide face with a square jaw, and a snub nose. It is the prevalence of this last type, concentrated in the mountain knot between the Beni Urriaghel and Gzennaya, which has reduced the stature and facial dimensions of these two tribes as units. These men are the most archaic culturally and the most inveterate feud fighters in the whole Rif.

As one moves westward along the northern Berber zone of Morocco, one encounters the Ghomara, on the Mediterranean slope of the curving ridge of mountains. These Ghomara, who trace their ancestry to an ancient invasion from the south, once formed an unbroken ethnic unit with their traditional relatives the Grand Atlas Shluh. They are as blond as the Riffians, but shorter (165 cm.), and are mesocephalic, with a mean cephalic index of 77.3 and a minority of brachycephals. Although the same types are found here as in the Rif, it is the shorter faced reduced Afalou variety, which leans in an Alpine direction, which is important.

South of the Ghomara and again west of the Rif, lie the high mountain tribes of the Senhaja Sghir, including Taghzuth, famous for its craftsmen in metal and leather; these people speak a Senhajan dialect normally incomprehensible to Riffians, who can, on the other hand, understand Ghomaran. Both the Senhaja Sghir and Ghomara, however, are in recent years tending to lose their Berber speech in favor of Arabic, since all or nearly all are bilingual. The Senhaja Sghir are darker, as a rule, than Riffians. A number are definitely negroid, whereas in the Rif negroid blood is confined to outsiders. Metrically the Senhaja Sghir are similar to the Riffians, but slightly smaller headed as a rule, and narrower jawed. There is among them a non-Riffian, Mediterranean element, which shows itself in a convex nasal profile and a sloping forehead, and which is reminiscent of eastern Barbary and of points farther east.

West of the Senhaja Sghir and Ghomara, and covering the entire mountain zone of the western third of Spanish Morocco, is the Jebala country, the home of numerous religious brotherhoods, and inhabited

by tribes very different culturally from the Riffians. The Jeballis, who have never been properly measured, are as a rule short, often stocky men, with small to medium-sized mesocephalic heads, aquiline noses, and small, pointed chins. They are usually brunet in hair color, but often mixed-eyed, and fair-skinned. In the northern part of the Jebala country, in the Anjera region which approaches the Straits of Gibraltar, the Nordic type of the Rif appears again with some frequency.

The Braber of the Middle Atlas, one of the three most numerous groups of Moroccan Berbers, have never been measured as a separate entity.[100] Of them one can merely give an eye-witness description, with all the faults of that method; the author's impression is that they are among the tallest people in Morocco, that they are usually long-faced and hook-nosed, with heavy beards, and that they are almost always brunet.[101] This impression is, needless to say, subject to future revision.

The fourth of the great Moroccan Berber groups, the Shluh, differs from the northern Moroccans in that they are rarely blond. Mixed and light eyes are reduced to the traditional Mediterranean 25 per cent; hair lighter than dark brown to 5 per cent, and beards of the same category to 25 per cent. Metrically they are fully Mediterranean, with a stature mean of 165 cm., smaller vault and face dimensions than the Riffians, and a mean cephalic index of 74.5. The total face height is 120 mm., the bigonial 100 mm. Individually they are mostly Mediterranean, of the straight-nosed, basic North African variety, and the chief deviation from this norm is in a negroid direction.

The Arabic-speaking population of the Moroccan plains is reasonably homogeneous, except for a certain negroid accretion, and looks like the Arab population elsewhere in North Africa. Although these "Arabs" must be partly Berber in blood, they, nevertheless, to a large extent, preserve their Arabian facial types. It cannot be denied that their ancestors who immigrated to Morocco at the time of the Hillali invasions came in large numbers. The ordinary city Arabs are little different from their pastoral and agricultural brethren, but this rule does not apply to the aristocratic families. These merchant-princes are sometimes blond, and of Nordic appearance; others of them look like Mekkan aristocrats in Arabia.

Before propounding any conclusions as to the racial history of western Barbary, it seems advisable to consider the racial history of that supremely

[100] The large series of Benoit and Kossovitch undoubtedly contains some Braber.

[101] At the village of Bahlil, 5 km. northeast of Sefrou, Kossovitch and Benoit measured an excellent series of Arabicized Berbers, who may be partly representative of the Middle Atlas population. These Bahloula are almost purely brunet, are of moderate stature (166.7 cm.), purely dolichocephalic (C.I. = 73.7) long-faced and leptorrhine. Kossovitch, N., and Benoit, F., **Anth,** vol. 45, 1935, pp. 347–363.

marginal cultural province, the Canary Islands. These islands, consisting of Lanzarote and Fuertaventura near the coast of Rio de Oro, Gran Canaria, Teneriffe, Gomera, and finally Palma and Hierro on the western fringe, were occupied by a Neolithic population of white racial type when the Spaniards conquered them, with great difficulty, during the fifteenth century. The adjacent African mainland, an utter desert, had by then long been the home of primitive Bedawin Arabs and of negroes.[102]

It is unlikely that the Guanches, as the native Canarians were called, had arrived there by the end of the Pleistocene, since no archaeological remains of a pre-Neolithic culture have been found, and the islands themselves are of recent volcanic origin. The Canarians lived by breeding pigs, sheep, and goats, and by the cultivation of barley and perhaps of wheat, although their use of the latter cereal is questionable. They ground their grain on rotary querns, and used chipped stone cutting implements. Polished stone celts of materials not found on the islands have been discovered by archaeologists, and iron spear points as well; apparently the Neolithic axe was given up by the early colonists through lack of material, and the metal of later visitors was also irreplaceable. Pottery is of a Neolithic type, but textiles were lacking. Arabic words in the speech of most of the islands, as well as alphabetic inscriptions on rocks, and the rotary querns, indicate that the islands were visited sporadically by people from the mainland from Neolithic times to the seventh century of the present era, if not later. The basic culture is a Neolithic *Schweinhirtenkultur* in Menghin's sense, with various losses and accretions.

At the time of the Spanish conquest, the islands contained a varied population of different physical types, stratified in social classes. There was definitely a tall, blond element, which lived by its flocks for the most part, and which seems to have been socially superior; a darker, more Mediterranean element which was more agricultural. Gran Canaria and Teneriffe were the centers of blondism, while of the two outlying islands, Hierro was prevailingly brunet, and Palma partly blond. The coastal islands of Lanzarote and Fuertaventura contained almost exclusively a tall, brunet population. The Guanches were described by the Spaniards as being frequently of giant size, and it is apparent from the difficulties of the Spaniards that they were redoubtable fighters.

The osteology of the Guanches has been exhaustively studied,[103] and

[102] Rio de Oro is actually one of the least known segments of the earth's surface.

[103] Hooton, E. A., *The Ancient Inhabitants of the Canary Islands.*
Verneau, R., *Cinq Années de Séjour aux îles Canaries.*
Tamagnini, E., *Os Antiquos Habitantes das Canarias.*
A complete bibliography of this subject up to 1925 will be found in Hooton's book. The cultural and historical summary given here is derived from this source.

does not wholly support the Spanish descriptions. For example, the mean statures reckoned from the long bones in Teneriffe and in Gran Canaria are only 166 cm. The crania as a whole are of moderate size; mesocephaly seems to have been the prevailing head form, with a cranial index of 75–76 in Teneriffe, Gran Canaria, and Hierro, and of 77.7 in Gomera. Since this is equivalent to cephalic indices of 77 to 80, it is apparent that the Guanches were less dolichocephalic than most living North Africans. The upper faces of most were not particularly long, and euryene crania are as numerous as mesene; in Gomera, the euryene are more numerous. The characteristic nose form in the outward islands (Lanzarote and Fuertaventura not studied) is mesorrhine, with the narrowest in Teneriffe (of Teneriffe, Gran Canaria, Gomera, and Hierro) and the least so in Hierro. The orbital index mean is in all islands low, exceptionally so in Gomera. The majority of crania from all islands is chamaeconch.

The Guanche skulls as a whole are unlike those of modern European Mediterraneans, and resemble northern European series most closely, especially those in which a brachycephalic element is present, as in Burgundian and Alemanni series. Hooton has divided them into clearly differentiated types, which include a Mediterranean, a Nordic, a "Guanche," and an Alpine. The "Guanche" accounts for 50 per cent of the whole on the four islands of Teneriffe, Gomera, Gran Canaria, and Hierro; the Nordic for 31 per cent, the Mediterranean for 13 per cent, and the Alpine for most of the remainder. The "Guanche" is particularly prevalent on Teneriffe, the Alpine on Gomera, and the Mediterranean on Hierro.

Hooton's "Guanche" type skulls, although not as large as the Afalou bou Rummel crania, resemble them morphologically, with heavy brow-ridges, strong muscular markings, low orbits, and lambdoidal flattening.[104] His Nordic crania are distinguished from the Mediterranean sub-group largely on a basis of size and robusticity. The Alpine crania bear what Hooton considers to be a slightly Mongoloid cast, as is also found in early European brachycephalic skulls of the Mesolithic and earlier.

After the Spaniards had conquered the Guanches and converted the survivors, they proceeded to intermarry with these new Christians, who perpetuated their kind in large numbers. On historical grounds there is every reason to believe that the living Canary Islanders are at least as

[104] Hooton wrote before the discovery of the Afalou crania. His theory of the multiple origin of this "Guanche" or Afalou group must be projected into an earlier period than he had supposed, in fact, a period contemporaneous with that of the Crô-Magnons from whom Verneau thought that the Guanches were descended.

much Guanche in origin as Spanish.[105] Fischer, who has studied the modern Canarians,[106] finds among them the following types:

(1) A true, small Mediterranean, which may be partly of Spanish introduction.
(2) A "Berber" type, with a heavier, broader face, but essentially Mediterranean.
(3) An "Oriental" type, with a narrow face, thin, convex nose, dark hair, and attenuated extremities.
(4) An Alpine of Bavarian appearance—this is said to be uncommon.
(5) The "Crô-Magnon" type; with a low, rectangular face, especially characterized by bigonial prominence; deep-set eyes under heavy browridges, with low orbits; a straight nasal profile, but relative broad nose; thin lips, and heavy jaw. This type has a thick-set body build, with trunk proportions similar to those of living Bavarians.

The living Canarians have nearly the same stature mean as their Guanche predecessors, 165.3 cm.; they also possess a comparable head form, with a cephalic index mean of 79. In a large series of males from all islands, there are three definite index modes, at 74, 79, and 83. The mean bizygomatic diameter of living Canarian males is 138 mm., the mean bigonial 111 mm. Nasal profiles are straight in 73 per cent of cases, and convex in only 11 per cent.

The hair varies from straight through wavy to ringlets, as in most Berbers. The hair color is black (Fischer #27), in 24 per cent of the series, dark brown (#4) in 47 per cent, and golden-brown to reddish in the rest. The lightest Fischer number recorded is #9. All of the near blonds are on the reddish or golden side; not a single ash-blond has been observed. In eye color, 84 per cent have shades between the Martin #1 and #6, including browns and very dark-mixed; the rest are evenly mixed or light-mixed. On the whole, the modern Canarians seem less blond than the Riffians. Despite this statistical evidence of the predominantly brunet quality of the modern Canarians, the blond beauty of the female inhabitants of Teneriffe is famous in seafaring quarters, just as the blondism of the early Guanches struck the Spaniards.

Fischer finds no Nordic type in the present-day Canarian population, but attributes the mixed blondism present in it to his "Crô-Magnon" element, which is the modern version of Hooton's "Guanche" type. Hooton readily states that he has no means of attributing any given pigment character to any one of his selected cranial types. It is, therefore, questionable whether there was a Nordic type in the Canary Islands in the pigmental as well as in the skeletal sense.

[105] Wölfel, J., **ZFE**, vol. 62, 1930, pp. 282–302.
[106] Fischer, E., **ZFE**, vol. 62, 1930, pp. 258–281.

The Canarian evidence, taken as a whole, is of great value in the reconstruction of the racial history of North Africa. It is evident that in the time of the Neolithic agriculturalists the Mediterranean food-producers must have associated, in some parts of North Africa at least, with the descendants of earlier Afalou-type people, who survived in the Canary Islands as an important factor in the imported population. The early Alpine-like strain found in the Canaries, especially in Gomera, may probably be attributed to a reëmergence of the brachycephalic element in the Afalou people, in a somewhat reduced form. This identification is confirmed by its extreme lowness of orbit and shortness of face. This type is comparable to the minor brachycephalic element found in other parts of North Africa, as in Ghomara and among the Kabyles, and it may conceivably be connected with the brachycephaly of Jerba. The Guanches were less dolichocephalic than most living Berbers, and had received a minimum infusion of the Atlanto-Mediterranean racial element which carried Hamitic speech.

The most troublesome factor in the whole North African racial problem lies in the necessity of explaining the origin of the local Nordics, whose presence as a minority in the populations of Tunisia, Algeria, and northern Morocco, if not in the Canary Islands, cannot be denied. There are two possible explanations, as follows:

(1) The North African Nordics resemble the mixed Nordics of Upper Palaeolithic inspiration found in Ireland and western Norway more than they do the ash-blond Eastern Valley Nordics of Norway, and those of Sweden. Therefore the so-called Nordics of North Africa are a mixture of brunet Mediterraneans of tall stature and considerable facial length with Afalou survivors. The minor blondism of these "Nordics" is derived from the Afalou side of the ancestry.

(2) The North African Nordics were partly formed as stated, but not wholly so, for there are some ash-blonds in the Rif; furthermore, the Riffian Nordics are lighter-haired than individuals of Afalou type, just as European Nordics are lighter-haired than are modern representatives of the Brünn race. Blond hair is positively associated with narrow noses, and the Afalou type nose is moderately broad. Unless it is possible to explain these phenomena as genetic recombinations, we must admit a Nordic invasion of North Africa from Europe or Asia as early as the second millennium B.C. Of the two continents, Asia is by far the more likely immediate source.

The racial history of North Africa may best be understood by analogy with western Europe, since parallel invasions entered both continental sub-areas, and parallel processes of evolution occurred in both. This parallelism started in the Pleistocene, with the sequence of Upper Pa-

laeolithic racial types. This was followed by the entrance of small Mediterraneans into both areas, in Mesolithic and Neolithic times, but of course earlier in North Africa, whence they entered western Europe. Tall brunet Mediterraneans arrived in both areas, by land in North Africa, by sea in western Europe. Nordics entered both from the east. Meanwhile the Palaeolithic types asserted themselves, in both unreduced and smaller, more brachycephalic forms. Thus we have in both regions Afalou or Borreby men, and Alpines. In Europe, we may add the Mongol and Lapp, in North Africa, the Arab and the Negro.

The difference between North Africa and western Europe racially is largely a difference in the relative numerical survival of the component elements, rather than in the nature of the elements themselves.

(15) THE IBERIAN PENINSULA

The Mediterranean world, which we have studied in Asia and Africa, possesses little undisputed territory on European soil. Aside from the western islands, including the Balearics, Corsica, and Sardinia, the only truly Mediterranean country in Europe is that of the Iberian Peninsula. The main events in Iberian racial history, as far as we know them, may be summarized as follows. In Upper Palaeolithic times Spain and Portugal were backward regions, peripheral to both France and North Africa. Influences from the north came in the earliest Aurignacian times, and again during the maximum cold of the last glaciation, when reindeer migrated southward over the Pyrenees. The extent to which influences came from across Gibraltar before the Mesolithic invasions is not known, but such influences cannot have been extensive. In the absence of adequate skeletal material, it is useless to speculate seriously upon the racial characters of the Upper Palaeolithic people of Spain and Portugal. If there were tall, large-headed men of Crô-Magnon or Afalou type, they have long since disappeared. It is perhaps more likely that the pre-Mesolithic Iberians may have included people resembling the Téviec group in Brittany.

Spain felt the repercussions of the drying of the Sahara earlier than did any other region in western Europe. Mesolithic invaders of a small, rather primitive Mediterranean type brought with them microlithic cultural traits; their racial characteristics are typified by the skeletal remains from Muge. During the third millennium B.C., food-producing peoples entered Spain from North Africa with swine, sheep, and goats, and with barley, emmer, and other plants. The physical type of these invaders is well known to us, not only through skeletal remains, but also by means of our study of the living peoples of North Africa. Some of these invaders remained in Spain and Portugal, where they became the

basic populations of these countries; others passed northward over the Pyrenees into eastern France and Switzerland, while still others passed northward as far as Germany, and into the British Isles.

Toward the beginning of the second millennium B.C., if not earlier, these agricultural colonists were reënforced by a people of much higher culture, the megalith-building tall Mediterraneans, who came by sea, and many of whom went on from Spain as far as the British Isles and Scandinavia. Their settlements in Spain were located mostly upon the eastern seaboard, and on the northern Atlantic coast, particularly in the region of the Bay of Biscay. They are followed by other peoples of a general Mediterranean type, but coming from Asia Minor, as their exaggerated nasal form indicates. These new invaders brought the knowledge of metal with them from the east, and were the first of the prospectors to visit this metal-rich peninsula. They in turn were followed by round-headed compatriots with the same nasal peculiarities, who introduced the Dinaric racial type to western Europe. These Dinaric brachycephals, who settled in the same regions as their maritime predecessors, probably left Spain in large numbers after a brief sojourn, in favor of countries farther north.

From Bronze Age time until the Roman conquest, there were only two known movements which may have affected Spain racially. One was that of the Phoenicians, a continuation of the prehistoric invasions from the eastern Mediterranean; the other was that of the Kelts into the north, to form the mixed nation of Kelto-Iberians known to the Romans. Many of the Kelts, however, also used Spain merely as a stopping place on their wanderings. In post-Roman times Germanic invaders, the Goths and Vandals, brought a second Nordic infusion to the peninsula, but the Vandals soon moved on to Algeria, thence to Carthage, and finally to Byzantium.

The invasions of the Goths and Vandals were shortly followed by a movement in the opposite direction, that of the Moors from across the Straits of Gibraltar. These Moors, who came in considerable numbers, were of two ethnic origins, Arab and Berber, and the latter group was without doubt the more numerous. During the eight centuries of Moorish rule in Spain, many people other than Arabs and Berbers came to live in the Iberian Peninsula; thousands of Sephardic Jews, some Slavs, a few Huns, and peoples of most of the nationalities which were in contact with the Moslem world. Persians were brought from Iran to make Shiraz wine, which is our present sherry; during the height of the Omeyyad caliphate in Spain, Andalusia became a center of world civilization, and like all such centers, drew to it many people from many quarters.

The expulsion of the Moors and of the Jews in 1492 robbed Spain of the forces which had brought it civilization, but gave the Spaniards

the impetus to conquer the New World. The shifting of population from the wholly Christian north to the former Moorish territory, combined with the drainage of men into the New World, must have caused some changes in the racial distribution of the peninsula, especially in combination with the departure of thousands of Moslems and of Jews. Many of these, however, preferred baptism to expulsion, and the contribution of North Africans and of Asiatics to the Iberian racial body, in historic as in prehistoric times, must have been considerable.

Despite the complex political history of Spain, the living population is basically and almost wholly Mediterranean. As we have seen in Chapter VIII, the regional stature means vary from 161 cm. to 168 cm.; more than one Mediterranean strain is obviously involved.[107] The head form is almost everywhere mesocephalic; [108] not even in Andalusia does a Moorish or Arab degree of dolichocephaly prevail. Provincial index means as high as 80 occur in the coastal regions of the northwest, in Lugo and Oviedo; Galicia and the Asturias, mining country, are still inhabited by people some of whom preserve the head form of the prospectors of the Bronze Age.[109]

The cephalic index rises in Spain as stature increases,[110] which would indicate that the Dinaric element is to a certain extent concerned with the coastal tallness, as is the early Atlanto-Mediterranean. In northern Spain, in the provinces which the Moors never occupied, blondism is commoner than in the south, where much of the population is as dark in skin and eye color as most non-Riffian Berbers.[111] Rufosity is rare in Spain except in the Asturias [112] and Galicia. During the Riffian war it was a common saying among the Riffian soldiers, "The ordinary Spaniards are as nothing, but watch out for the small red-headed men, the Gallegos. They are *shaitans*, and do not know fear."

Any careful observer acquainted with the Spanish will recognize a number of distinct racial types; the honey-skinned Andalusian, with his medium stature, lithe body, flat temples, and finely modeled nose and chin; the hook-nosed Cappadocian type so well exemplified by General Francisco Franco; the large, sometimes fleshy approach to a brunet Dinaric; the rather small and delicate local variety of Nordic, with exaggerated narrowness of face and nose, pale skin, and golden rather than ashen blondness; and the coarse Mediterranean type found among

[107] Oloriz y Aguilera, F., *La Talla Humana en España.*
[108] Oloriz y Aguilera, F., **BRSG,** vol. 36, 1894, pp. 389–422.
Barras de Aragon, F. de las, **MSAE,** vol. 2, 1923, pp. 1–68.
[109] Barras de Aragon, F. de las, **MSAE,** vol. 4, 1925, pp. 83–100.
[110] MacAuliffe, L., and Marie, A., **CRAS,** Paris, vol. 171, 1920, pp. 1077–1079.
[111] Hoyos Sainz, L., and Aranzadi, T. de, **AFA,** vol. 22, 1893–94, pp. 425–433.
[112] Uria y Riu, J., **MSAE,** vol. 3, 1924, pp. 139–144.

the peasantry in most of Spain, short of stature, relatively thick-set, with a mesocephalic head form, a short, broad-looking face, and a short, broad, and often concave nose. This last type may, to a large extent, date back to the Mesolithic, with older accretions; it is the most primitive, most submerged element in the Spanish population. Alpines may be found, here and there, among Spaniards, but they are rare; it is their virtual absence which makes Spain a Mediterranean rather than a central European country, in the racial, as well as the geographical, sense.

Two widely observed racial characters serve to differentiate the Spaniards from most of the living inhabitants of Arabia and North Africa: hair color and nasal profile. In Spain, as a whole, some 29 per cent of the male population has black hair, some 68 per cent dark brown, while traces of blondism are visible in 17 per cent.[113] In most of North Africa and Arabia, the black hair is commoner than the dark brown. The nasal profiles of some 120,000 Spaniards are convex in 15 per cent of cases, straight in 72 per cent, and concave in 13 per cent. In Arabia and North Africa east of Morocco, the commonest profile form is usually convex, and concaves are very rare. The prevalence of these two features, dark brown hair and a straight nasal profile, indicates that the bulk of the Spanish population is derived from the earlier Mediterranean invasions of Mesolithic and Neolithic date. The Spaniards are more like the most marginal and fully sedentary of the brunet Berber groups in North Africa than like the more recently settled transhumant ones or the Arabs.

The eye color in the total Spanish group is listed as: blue, 18 per cent;[114] brown, 68 per cent; black, 14 per cent. Dark-mixed eyes must undoubtedly fall, in many cases, into the brown class; still it is doubtful that in most parts of southern Spain, Catalonia, and Portugal much more than 25 per cent of incipient eye blondism is to be found.[115] In Spain as a whole, 46 per cent of definitely dark skin, in the very brunet-white and light brown category, again marks the population of this peninsula off from most of Europe. The regional variation in this is great; the darkest skins are in the south, in the country of Moorish occupation.

Several relatively complete anthropometric series give us a means of comparing Spaniards with other peoples. A series of 79 Spaniards measured in Madrid [116] have head dimensions comparable to those of

[113] Sanchez Fernandez, L., *El Hombre Español.* Résumé in **MAGW,** vol. 44, 1914, p. 330. This work covers a series of 119,571 20 year old male Spaniards.

[114] Identical with the percentage of total light eyes found by Hoyos Sainz and Aranzadi. In the north of Spain this percentage runs from 21 per cent in Castile to 35 per cent in Navarre and the Basque province.

[115] An apparently accurate figure for Portugal is 28 per cent.
Tamagnini, E., **CEAP,** vol. 1, Facs. 3, 1936.

[116] Barras de Aragon, F. de las, published in Williams, G. D., *Maya Spanish Crosses in Yucatan.*

Yemenite Arabs, Oriental Jews, and Kabyles. The vault length (191 mm.) and breadth (150 mm.) yield a mean cephalic index of 78; the auricular height is 126 mm. Facially, the Mediterranean character of this group is pronounced; a menton-nasion height of 120 mm. and an upper face height of 73 mm. show the typical Mediterranean exaggeration of upper face length combined with the usual shallowness of jaw. The minimum frontal (105 mm.), bizygomatic (133 mm.), and bigonial (102 mm.) diameters, are likewise convincingly Mediterranean. The nose is high (56 mm.), narrow (33 mm.), and very leptorrhine—more so than with most Spanish groups. This sample could be used as a world standard of the central Mediterranean race, although it undoubtedly consists of an amalgam of several Mediterranean strains.[117]

Another useful series is one of 420 adult males from Andalusia, representing the most brunet population in Spain, and the one which supposedly contains the most Arab and Berber blood.[118] These Andalusians have a mean stature of 166.5 cm., approximately the same as that of the smaller Moroccan Berbers, the Kabyles, and the modern Egyptians. Their mean relative sitting height, 50.6, relates them to North African and Asiatic Mediterraneans, rather than to most Europeans. The rest of their bodily proportions follow the same relationship. Cranially and facially, they differ little from the Madrid series, except in the possession of a wider bigonial (104.5 mm.) which may perhaps be a North African heritage.[119]

The skin color of the Andalusians is light brown, corresponding to #15 to #18 on the von Luschan chart, in 80 per cent of cases, while only one man in six has a pinkish-white skin of the type so frequent among Riffians. Sixty per cent have dark brown hair, 30 per cent black hair. The remaining 10 per cent show some evidence of blondism or of rufosity. Only one man out of 420 was truly blond. The hair is straight in half the series, wavy in a third, and curly in a sixth. Six men in the entire group have negroid, frizzly hair; a minor absorption of negro blood, dating from Moorish times, is evident. As a whole, however, Andalusians are free from negroid traits. As among most Mediterraneans, beard and body hair are not abundant.

Sixty per cent of Andalusians have pure brown eyes, of which the majority are dark brown, although light brown and mixed-brown irises occur. Mixed-light eyes comprise 30 per cent of the series, with a prevalence of greenish-brown shades, while 10 per cent of the whole sample possesses bluish-gray eyes, on the gray rather than blue side. A ratio

[117] Another good regional series, which is very similar, is that from Caceres. Aranzadi, T. de, **ASE**, ser. 2, vol. 3, 1891.

[118] Unpublished thesis by Dr. Frederick S. Hulse, "The Comparative Physical Anthropology of Andalusians and Cubans," 1934, Cambridge.

[119] Other differences seem to be of a technical nature.

of 40 per cent of light or incipiently light eyes is higher than one expects to find among racially pure Mediterraneans, and indicates the infusion of Nordic blood, from both North European and Berber sources. Probably if the rest of Spain were studied for eye color in the same way, higher ratios of eye blondism would appear elsewhere, since most of the green-brown eyes in this sample are predominantly dark.

Eyefolds among Andalusians are practically lacking. The opening of the eye lids is usually of moderate height, and of horizontal direction. A very small minority shows slanting eyes reminiscent of the Egyptian ideal of beauty. The eyebrows are moderately thick, and eyebrow concurrency occurs in 70 per cent of the series; since concurrent eyebrows are rare among present-day North African Mediterraneans, this suggests early influences from the eastern Mediterranean, as well, perhaps, as later ones from Arabia. Browridges are characteristically small to medium; foreheads are of only moderate height and breadth, and the forehead slope is, as a rule, slight; it is lacking or vertical in roughly 14 per cent of the total group. On the whole, the forehead form of these Andalusians is typically Mediterranean, and often infantile.

The nasion depression is small to medium; the nasal root is usually quite high and of moderate breadth; the nasal bridge is of moderate height and breadth, and the nasal profile is usually straight. As in the total Spanish series, 18 per cent show convex profiles, while concavity is limited to 15 per cent. The nasal tip is absolutely small or medium, and usually horizontal or slightly depressed. Nasal wings are usually compressed or medium. From these data we derive a picture of a high-rooted nose with a moderate bridge height and a straight profile, a thin tip, and compressed wings.

Lips are of medium integumental and membranous thickness; really thick lips are rare, and the lip seam is usually difficult to observe. Alveolar prognathism is almost always absent. The chin is of slight to medium prominence. The malars are of moderate forward prominence, and are usually compressed laterally, while the gonial angles show usually little or no flare. In the external morphology of the vault, the temporal region is frequently flattish, giving the skull an ill-filled appearance. The occipital protrusion is usually moderate, while 2 per cent are found with no protrusion, indicating an occiput of Armenoid or Dinaric shape. Lambdoid flattening occurs in 12 per cent of the series; this low incidence suggests that little if any of the Afalou element from North Africa is present in Andalusia.

The racial character of the richer, city-dwelling Moors of Andalusia, before the time of their expulsion, may be suggested by a study of the almost wholly unmixed descendants of these émigrés in Morocco. In

the city of Sheshawen the old, aristocratic families are descended from the former aristocrats of Granada, and have lived endogamously since 1492. A little Riffian blood has crept in, but aside from that the Sheshawen families remain an island of Andalusian Moors on Moroccan soil.

A small, homogeneous sample [120] of these people shows a much closer relationship with Spain than with Morocco. They are a little longer-headed (194.5 mm.), a little more dolichocephalic (C. I. = 76.5) and a little longer-faced (123 mm.) than the Christian Andalusians; the bigonial diameter of 103 mm., although wide for Spain as a whole, is of Andalusian size. The Sheshawen Moors have predominantly dark brown hair and dark brown eyes, with brunet-white skin color. In facial morphology, they are fully Andalusian. The implication is that the Moors in Spain took more from the population of the peninsula, in a racial sense, than they gave. Our earlier conclusion that the Andalusians are Mediterraneans of largely Neolithic derivation is supported by this unexpected evidence.

Portugal is, on the whole, fully as Mediterranean in race as is Spain and, perhaps, in some respects, it is more so.[121] The chief differences between the two countries are: (1) that the Portuguese are almost uniformly brunet in pigmentation and (2) that there are no regions in Portugal in which brachycephaly is as important as in the Asturias and Galicia. In fact, Portugal contains some of the lowest cephalic index means on the continent of Europe.

Historically, Portugal has long been divided into two parts, a northern and a southern, with the river Tagus forming the boundary between the two. In pre-Roman times the Lusitanians lived in the northern half of the country, while other tribes inhabited the south. Later on, the Keltic invasions affected only the north, as did the inroads of the Germans. On the other hand, the Arabs and Berbers settled mostly in the south. Relations between Moslems and Christians lacked, in Portugal, the bitterness manifested in Spain, and many Portuguese Moslems were baptized at the time of the expulsion.

[120] Coon, C. S., *Tribes of the Rif.*

[121] Some of the principal works on the physical anthropology of Portugal are:

Barros e Cunha, J. G. de, **CEAP,** vol. 2, Facs. 6, 1931.

Cardosa, F., **Portugalia,** vol. 1, 1899–1903, pp. 23–56; vol. 2, 1905–08, pp. 179–186, 517–539.

Dos Santos, J. R. Jr., **TSPA,** vol. 2, Facs. 2, 1924, pp. 84–186.

Mendes Correa, A., **AAPP,** vol. 10, 1915; **AJPA,** vol. 2, 1919, pp. 117–145.

Tamagnini, E., **CEAP,** vol. 1, Facs. 3, 1936; vol. 2, Facs. 7, 1932; vol. 2, Facs. 10, 1933.

Themido, A. A., **CEAP,** vol. 2, Facs. 5, 1931; vol. 2, Facs. 9, 1933.

Sant'Anna Marques, S. de, **Portugalia,** vol. 1, 1899–1903, pp. 427–428.

As in southern Spain, the skin color is evenly divided between a light brown, 45 per cent, and brunet-white, 45 per cent, while pinkish-white skins are found in only one-tenth of the population.[122] Again as in Spain, the prevailing hair color is dark brown, which amounts to 68 per cent of the total; blond and red hair is limited to 2 per cent. Eye color, with 7 per cent of "blue," 15 per cent of "medium," 78 per cent of "dark," shows some correlation with latitude, which is not as clear in the cases of skin color and hair color. Blue eyes run to 13 per cent in the north, and as low as 1 and 2 per cent in the south. Dark eyes seem to range inversely from 71 per cent to 87 per cent. Portugal contains no more than the traditional 25 per cent of incipient blondism common to many groups of Mediterraneans.

Regional stature means in Portugal vary from 162 to 165 cm., while the mean for the whole country is 163.5 cm. The shortest statures are found in the Tagus valley; the tallest in both the north and the south. The stature curve for the entire country shows a slight skewness, with concentrations at 158 to 160 cm., and 164 cm. The second peak is by far the greater. The inference is that a short Mediterranean type has been absorbed by one of moderate stature. The mean relative span of the Portuguese is 102, a normal Mediterranean racial mean, but the relative sitting height rises to a mean of 53.2, which is high for Mediterraneans and more typical of Europeans outside the Iberian Peninsula. The cephalic index mean for the entire nation is 76.4, with two prominent peaks in the distribution curve, one at 74 and the other at 77. Regional variation is slight, with provincial means ranging from 75 to 78. The most dolichocephalic local groups live in the northwestern part of the country. The heads of the Portuguese are large in relationship to their stature, with a mean head length of 194 mm. and a breadth of 147 mm.

In a large series of modern Portuguese crania,[123] while all are typically Mediterranean in morphology, a clear difference may be seen between several distinct types. In the first place, the head length has two definite modes at 179 mm. and 186 mm., while the head breadth has modes at 132 mm. and 141 mm. The cephalic index has modes at 70, 73, and 75. From this evidence, as from that of stature, we are led to the conclusion that two or more different Mediterranean strains are involved in the Portuguese population. This conclusion is strengthened by the fact that the orbital index of Portuguese crania is bimodal, with modes at 85 and 88. There is both a low-orbitted and a moderately high-orbitted element in this population.[124]

[122] Tamagnini, E., **CEAP**, vol. 1, Facs. 3, 1936.
[123] Barros e Cunha, J. G. de, **CEAP**, vol. 2, Facs. 6, 1931.
[124] Themido, A. A., **CEAP**, vol. 2, Facs. 5, 1931.

Returning to the living, we find that the upper facial index, the mean of which is 54.3 for the entire nation, shows regional differences, being consistently higher in the north and lower in the south. Two peaks at 49 and 54 are clearly differentiated, and the former is the larger. In most of Portugal the leptene tendency is associated with relatively great dolichocephaly, but in the coastal regions of the north, in Entre Douro and Minho, a leptene face is associated with brachycephaly and tall stature, indicating that in this region there is evidence of a submerged Dinaric element which may, presumably, be attributed to the early metal age invasions.

Detailed studies of small regional populations have been made in various parts of Portugal. A particularly interesting community is that of São Pedro Magodouro in a mountainous olive-growing section of Bragança, in the province of Tras os Montes.[125] These people are the most dolichocephalic group in Portugal, and may serve as an illustration of one end type in the Portuguese population. Stature is short to moderate, with a mean of 163 cm.; the relative sitting height is 51.9; the relative span, 102.5. The head length mean is 193 mm., that of head breadth 141 mm., the auricular height mean, 122 mm. Thus the cephalic index of 73.3 would be low even for North Africa; the absolute length is of a normal Mediterranean size, while the vault is low. The face is short, 119 mm., and narrow, 133 mm., while the bigonial has the relatively great breadth of 105 mm. The nasal dimensions, 55 mm. by 35 mm. are typically Mediterranean, and the length is particularly great in relationship to vertical facial dimensions. The nasal index of 67 is moderately leptorrhine. In almost all instances the nasal profile is straight. The skin is dark, the hair is dark brown, and the eyes are of a medium brown shade. This population conforms, in most respects, to Deniker's Ibero-Insular type, and may be taken as a relatively pure example of the shorter, longer-headed strain among the Portuguese. A few individuals in this group show Nordic influences, which manifest themselves in taller stature and mixed or light eye color.

Other local series, which represent the coastal regions of northern Portugal rather than the interior, are relatively Mediterranean, and are comparable metrically to Spanish groups. Some of the fishing villages along the coasts, however, contain locally differentiated populations as do fishing villages everywhere; one, Povoa de Varzin in Minho province,[126] is distinguished by a slightly greater than usual degree of blondism, broad faces, and broad jaws (bizygomatic = 133 mm., bigonial, 108 mm.). Whence this broad-faced strain is derived is not known. It is

[125] Dos Santos, **TSPA,** 1924.

[126] Cardosa, F., **Portugalia,** vol. 2, 1905–08, pp. 517–539.

curious that the Portuguese, like the Andalusians, are broader jawed than most Mediterraneans, and comparable in this respect to some Berbers.

The apparent homogeneity of the Portuguese, in a racial sense, masks the presence of several brunet Mediterranean strains, as Portuguese anthropologists are well aware. One may distinguish tall Atlanto-Mediterraneans, particularly in the southern provinces, as well as the small, extremely long-headed type found in São Pedro Magodouro. The coarser mesocephalic strain, which dates back to Muge, may also be identified.

Non-Mediterranean elements in the Portuguese population are rare and of little importance. A few Nordics are scattered throughout but are particularly concentrated in the north. Traces of Dinaric blood, as we have already seen, may likewise be found on the northern coast. Negroid blood, introduced into Portugal through the medium of freed slaves, has largely been absorbed. The liberated negroes settled mostly in the cities, where negroes from the Portuguese colonies are still to be seen in some numbers. The liberality of the Portuguese social attitude toward persons of different race has prevented the retention, as in Arabia and the United States, of a stigmatized negroid class. On the whole, the absorption of negroes by the Portuguese has had no appreciable effect on the racial position of the country. Portugal remains, as it has been since the days of the Muge shell-fish eaters, classic Mediterranean territory.

(16) THE WESTERN MEDITERRANEAN ISLANDS

A study of the Mediterranean racial area in southwestern Europe would not be complete without the inclusion of the Balearics, Corsica, and Sardinia. The Balearic Islands contain a population taller than that in most of Spain, but equally dolichocephalic; the settlement of megalith-building Atlanto-Mediterraneans on these small islands in late Neolithic and early Metal Age times has left a permanent imprint on the population.[127] The tall, long-faced type of Spaniard so frequently seen in the Guardia Civil is common here. Corsica and Sardinia, although equally popular with the megalith-builders, are larger islands and are extremely rugged topographically, so that a more numerous pre-Megalithic Mediterranean element was enabled to survive, and to reëmerge as the present population.

Corsica is extremely mountainous, and the mountains rise directly out of the water. The Corsicans of the interior part of the island have pre-

[127] References which include the Balearic Islands are:
Oloriz y Aguilera, F., **BSAP**, ser. 4, vol. 5, 1894, pp. 520–525; **BRSG**, vol. 36, 1894, pp. 389–422.

served a culture of early Mediterranean origin with little change; their houses, their agriculture, their endogamous marriage system, their predilection for the blood feud, and their insistence upon personal freedom relate them ethnologically to the mountain Berber groups of North Africa. In historic times Corsica has belonged to many nations, from the Phoenicians to the French, but until the present her allegiance has been in most cases nominal, and throughout many changes of masters, the islanders have preserved their own character. The only actual immigration of outsiders recorded in recent times is that of 730 Greeks from the Peloponnesus who settled in the town of Cargèse, on the west coast of the island, in 1676. The descendants of these Greeks still preserve their ethnic identity, and remain unabsorbed.

Anthropometric studies of living Corsicans [128] place them in approximately the same racial position as the Portuguese. The stature mean for the island is about 163 cm., the cephalic index, 76.6. Light or light-mixed eyes are probably under 20 per cent, while the commonest iris color is dark brown, or black. The hair color is black or dark brown, more frequently the latter; shades ranging from medium brown to blond include 15 per cent of the whole.

In general, the coastal population, particularly in the northern and western parts of the island and in the towns, is taller and less long-headed than that of the more isolated interior villages. The coastal people, from Bastia to Ajaccio, have a mean cephalic index of 77; 76 is the mean for the southern part of the island, and 75 for the interior. The Greeks of Cargèse have a mean of 77.8. In Bocognagno, an isolated mountain section, 38 per cent of the recruits summoned for military service were rejected on the grounds of being shorter than 154 cm.

There is one exception to this rule that the inhabitants of the kernel of the island are the shortest, longest-headed, and darkest, however—that is in the inaccessible plateau region of Niolo, in the very center of the island, where a tall, long-headed, and prevailingly blond group of people has been found. They are apparently Nordics, not unlike Riffians in appearance, and are a closely inbred local group. Whether they represent the survival of an ancient blond racial stratum in the Mediterranean area, or are the descendants of some early refugees to this mountain

[128] Duckworth, W. L. H., **ZFMA**, vol. 13, 1910–11, pp. 439–504; **PCAS**, vol. 13, (7 n. s.), 1909, pp. 267–279.

Fallot, A., **RDAP**, ser. 3, vol. 4, 1889, pp. 641–674; **BMSA**, ser. 6, vol. 2, 1911, pp. 43–54.

Jaubert, L. J., **BSAP**, ser. 4, vol. 4, 1893, pp. 756–760.

Mahoudeau, P. G., **REAP**, vol. 16, 1906, pp. 177–195.

Mattei, A., **BSAP**, vol. 11, ser. 2, 1876, pp. 597–619.

Rocca, P., *Les Corses devant l'anthropologie.*

fastness, cannot be determined without a careful, modern survey of Corsica. In view of present evidence it appears that the Corsicans, like the North Africans, Spaniards, and Portuguese, are a blend of different Mediterranean strains, and that here, as in the more marginal Berber groups and in Portugal, a small, very long-headed Mediterranean type is both old and numerous, while later, taller, Atlanto-Mediterranean forms are also present. The Nordic problem is a local puzzle which awaits solution.

Culturally and historically, Sardinia resembles Corsica closely. The same intense Megalithic activity, followed by Greek and Carthaginian influences, and later by Roman rule, mark early Sardinian history. In later times the Saracens obtained possession of the island, but were expelled shortly afterward. Spain ruled Sardinia from roughly 1300 to 1700 A.D., and Spanish cultural influence is to be seen in most of the cities. In Sassari a dialect is still spoken which includes Spanish elements. In 1718 A.D., when Sardinia was given to the princes of Piedmont in exchange for Sicily, the townsfolk of Sassari were considered Spanish, and the country folk pure Sardinian. The language of the Sardinians, like that of Corsica, is a form of Italian, but pre-Italic languages were spoken on the island as late as the time of the Roman empire. These may have dated back to the period when the Shardana appeared as one of the western sea people attacking Egypt in Middle Kingdom times.

Anthropometrically, the Sardinians are a little better known than the Corsicans.[129] They are, on the whole, a little shorter than the inhabitants of the more northernly island, with a stature mean of 162 cm., while nearly identical in head form (76.5).[130] The hair color is designated as black in over half of the Sardinian groups measured, while hair blondism attains the ratio of but 1 per cent. Mixed or light eyes run to about 15 per cent. As in Corsica, many irises are deep brown or black.

Measurements and indices of the head and face related the Sardinians to the smaller Berber groups and to the Portuguese,[131] and this resemblance is confirmed by the study of modern Sardinian crania, which show that the Sardinians are low-vaulted dolichocephals and mesocephals, with short faces and skeletally mesorrhine noses. Among Sardinian crania

[129] Duckworth, W. L. H., **ZFMA,** vol. 13, 1910–11, pp. 439–504.
Hawes, C. H., unpublished measurements on 12 Sardinian soldiers, measured in Crete. Permission for use granted.
Livi, R., *Anthropometria Militare.*
Niceforo, A., **ASRA,** vol. 3, 1896, pp. 201–222.
d'Hercourt, G., **BSAP,** ser. 3, vol. 5, 1882, pp. 463–471.

[130] Livi's cephalic index mean for Sardinia, 77.5, is apparently one unit too high. This may be explained by his use of a craniometric frame, instead of calipers. See Duckworth, W. L. H., **ZFMA,** vol. 13, 1910–11.

[131] Detailed data are almost entirely limited to Hawes's small series.

are a number which show a combination of prognathism, a primitive condition of the lower border of the nasal aperture, and extreme dolichocephaly.[132] Regional studies within the island show that among the living population the inhabitants of the more remote mountain villages are shorter-statured, longer-headed, and more purely brunet than are those living nearer the coast. The relatively great antiquity of the most primitive small Mediterranean type is indicated, while at the same time the Nordic nucleus found in Corsica seems to be lacking here.

Sardinia and Corsica were peopled at the beginning of the Neolithic by a race of short-statured, dolichocephalic, low-vaulted, brunet Mediterraneans, coming probably from several quarters, including the adjacent European coasts, North Africa, and the eastern Mediterranean. Subsequent immigrations of other Mediterranean peoples have affected the racial composition of these islands but little.

(17) THE BASQUES

The last contiguous outpost of the Mediterranean world on the north and west is the country of the Basques, which, since it straddles the Pyrenees, forms a zone of transition into the brachycephalized world of central Europe. The Basques are people who, although they lack political identity, are, none the less, a nation. They number about 800,000, of whom four-fifths live in Spain, and the remainder in France. Their country is clearly delimited by a linguistic boundary, and their ethnic solidarity is perpetuated not only by their language but also by a community of archaic cultural practices, by special political privileges under the Spanish monarchy, by a distinctive headgear,[133] and by the recognition of a characteristic physical type.

The Basque language, being an agglutinative non-Indo-European form of speech, has attracted the attention of theorists in great, and of linguistic experts in small, numbers. In its grammatical structure Basque falls into the same class as many American Indian languages, as Georgian, as Circassian, and as the Burushaski language of Hunza. Lexically no valid comparisons have as yet been made between Basque and any other language. Since Indo-European languages were unquestionably late to arrive in southwestern Europe, and since Hamitic languages were apparently not indigenous to northwestern Africa, it is not unreasonable that some pre-Indo-European, pre-Hamitic language should survive somewhere on either side of the Straits of Gibraltar. Basque is probably the modern descendant of (a) a language or languages brought by food-producing Mediterraneans into Spain during the Early Neolithic period;

[132] Duckworth, **ZFMA**, vol. 13, 1910–11.

[133] Distinctive until adopted by tourists in the 1920's.

or (b) a language or languages brought from western Asia by seafaring peoples in pre-Phoenician times; or (c) a blend of languages from both sources. Other explanations seem, in the light of present knowledge, fantastic.[134] Basque is certainly Iberian, if by Iberian is meant all the pre-Aryan languages of the Iberian peninsula.

There is historical evidence to indicate that in Roman times the Basques lived farther south and east in Spain than at present, and that they were later pushed northward by Gothic pressure. Between 580 and 587 A.D., some of them crossed the Pyrenees into France, and since that time they have been advancing steadily northward at a slow rate. It is claimed by French authorities that the Basques in France have preserved their native culture better than have those in Spain, and that by the same token the French Basques are the purer racially.

The Basques are people of moderate stature, with means of 164 cm. in Spain and 166 cm. in France. They are lightly built, ideally with broad shoulders and narrow hips, and a conical thorax. These generalizations as to body build are the result of general observation rather than of anthropometry. Nevertheless it is likely that they are, to a large extent, founded on fact. The ideal Basque type, which is not merely an artistic standard, but a reality, is chiefly identifiable by means of a combination of facial features. The forehead is straight or but slightly sloping, the browridges weak or absent, the nasion depression slight or absent, the nose thin, often aquiline, with a thin tip, sometimes depressed; the forehead is broad, the mid-face quite narrow, the mandible extremely slender and narrow through the bigonial region, and the chin is narrow and pointed. The Spanish Basques are mesocephalic, with a mean cephalic index of 78, while the French Basques are sub-brachycephalic, with a mean of about 82.

The French Basques are by no means all brunet; Collignon finds 22 per cent of blue eyes, 44 per cent of "medium," and 34 per cent of dark. Black hair is found in 7 per cent of the group, brown in 77 per cent, and light brown to blond in 16 per cent. Among the Spanish Basques the incidence of blondism is somewhat lower, but the Basques are still light when compared to most other inhabitants of Spain. The nasal profile

[134] My predecessor, Professor Ripley, devoted an entire chapter of his *Races of Europe* to the Basques; Chapter 8, pp. 180–204. His sources were the same as those available today, with one important exception: Morant, G. M., **Biometrika**, vol. 21, 1929, pp. 67–84. The reader is referred to Ripley's work for an otherwise complete bibliography on this subject, as well as for an interesting exposition and discussion. See also Montandon, G., *L'Ethnie Française*, pp. 125–137. The most important anthropometric sources are, apart from Morant:

Aranzadi, T. de, *El Pueblo Euskalduna.*

Collignon, R., *Les Basques*, **MSAP**, ser. 3, vol. 1, 1894.

Oloriz y Aguilera, F., **BSAP**, ser. 4, vol. 5, 1894, pp. 520–525.

is convex in some 49 per cent of French Basques, as compared to 43 per cent of Spanish ones.

The exact metrical position of the Basques may best be determined by the study of their crania.[135] Morant, in a study of 76 male crania from Guipuzcoa, finds that the Basques are not unusual in the dimensions and morphology of the cranial vault. A length of 186 mm., and a breadth of 143 mm., are moderate in size, while the cranial index of 77 is mesocephalic. The basion-bregma height of 131 mm. is definitely low. The Basque crania closely resemble those of the British Iron Age people and of the seventeenth century Londoners. They conform metrically, in other words, to a Keltic Iron Age type, which was a mixture of Nordic with Dinaric elements.

Facially this resemblance to British skulls is even closer; but the Basques attain or approach several European extremes. The mean bi-malar face breadth, taken between the lowest points of the malar-maxillary sutures, is 89.6 mm., a craniological minimum, and the nearest approach to it is the dimension of 90.9 mm. for the Whitechapel English crania. The mean breadth of the nasal aperture, 22.9 mm. is also an extreme, most closely approximated by a Lowland Scottish series. The bizygomatic diameter of 129 mm. is not extreme, for it is higher than that of both Sardinian and Portuguese crania. The basion-alveon diameter, 91.9 mm., is the lowest mean known, and in combination with other dimensions indicates an extremely orthognathous condition.

On the whole, these craniological data indicate three facts: (1) the Basques are basically Mediterranean (in the wider sense) racially, with some brachycephalic accretion.

(2) This accretion is for the most part Dinaric and only to a minor extent directly Alpine. Morphologically the Basque crania show many resemblances to those of Serbo-Croats and of some South Germans. Collignon's comparison between French Basques and the southwestern French makes this distinction clear.

(3) The Basques, through inbreeding, ethnic solidarity, and the possession of a recognized national ideal type, have developed a characteristic physiognomy, the essential features of which are nasal prominence and a narrowness of the median sagittal facial segment, and of the mandible.

Collignon believed, and Montandon follows him, that the French Basques are freer from modern mixture than are the Spanish Basques. This may perhaps be true, since neither the round-headed tendency

[135] Morant, 1929. It is high time that someone should make a modern anthropometric survey of living Basques in both France and Spain. Many of Collignon's measurements on the living do not follow modern technical standards.

of the French Basques nor their relatively high incidence of blondism can be wholly explained as local acquisitions. The Basques, as a whole, represent an ancient and subsequently specialized mixture of Mediterraneans and Atlanto-Mediterraneans with partially blond Dinarics, and it is just as possible that different Basque sub-groups differed originally in amount of Dinaric blood as that the modern Spanish Basques have been altered through Spanish mixture.

Both the Atlanto-Mediterranean and Dinaric elements mentioned were present as early as the Copper Age in North Central Spain, where they were partially identified with the early Bell Beaker culture. The Keltic Iron Age racial type of Britain, which the living Spanish Basques so closely resemble, was produced originally in southern Germany from a combination of Nordics with Bell Beaker or other Dinarics, and imported into England where Mediterranean and Atlanto-Mediterranean elements, as well as some Bronze Age Dinaric factors, were already present. The mixture of similar ingredients in different places produces similar results. Seen in the light of modern physical anthropology, the Basques are still interesting, and perhaps romantic, but no longer mysterious.

(18) THE GYPSIES

Within the greater confines of the Mediterranean race must be placed one people of non-European origin, the Gypsies. The Romanies, the Tziganes, the children of Little Egypt, are believed, on authoritative grounds, to be the descendants of one or more pariah tribes of northwestern India who for some unknown reason began to wander westward before or about the turn of the present millennium, at about the same time that Lief Erikson was discovering America.[136]

They are believed to have travelled across Iran into Armenia, and thence into the Asiatic territory of the Byzantine Empire, where they arrived at some time between 1100 and 1200 A.D.; their first appearance in Europe cannot be traced back earlier than 1300 A.D. A second wave passed again through Persia and the Armenian highlands, but turned southwestward into Syria, Egypt, and North Africa. The language of

[136] See Gaster, M., article "Gipsies," *Encyclopaedia Britannica*, thirteenth edition.

Lebzelter, V., **MAGW**, vol. 52, 1922, pp. 23–42, contains an historical summary as well as anthropometric data.

Other anthropometric sources include:

Glück, L., **WMBH**, vol. 5, 1897, pp. 403–433.

Karpeles, B., **MAGW**, vol. 21, 1891, pp. 31–33.

Kopernicki, I., **AFA**, vol. 5, 1872, p. 267.

Marie, A., and MacAuliffe, L., **CRAS**, vol. 172, 1921, pp. 49–50.

Pittard, E., **Anth**, vol. 13, 1902, pp. 321–328; vol. 15, 1902, pp. 177–187; **BSAL**, vol. 22, 1904, pp. 207–217; *Les Peuples des Balkans*.

the European Gypsies is basically Indian, a derivative of Sanskrit or Prakrit, but it contains also words picked up in transit through Persia and Armenia. Words of other languages, Greek, Rumanian, Magyar, give evidence of passage through European countries. In each country the Gypsy speech has adapted itself to the language of the non-Gypsy inhabitants; in the far periphery, in England and in Spain, it has become no more than a half-language with as many local as Romany words, as any reader of George Borrow will recognize.[137]

In the Balkans and Hungary some of the Gypsies were made landed serfs under the jurisdiction of nobles and churchmen, others were given special charter to wander; these latter practiced the trades of tinkers, wood carvers, gold panners, and minstrels, while their women exercised from their first appearance their calling of sorceresses and fortune-tellers. Although nomadic from the beginning, the Gypsies were not especially concerned with horse breeding and horse trading in eastern Europe; it was only in the west, where regulations and restrictions kept them on the move, that this specialty was developed.

After about a century in eastern Europe, some of them began to wander westward, and arrived in Germany in 1417, France in 1427, and England in about 1500 A.D. Some passed on through the Basque Provinces into Spain, others spread northward as far as Sweden and Finland. All said that they came from "Little Egypt," and must go to Rome to expiate some sin of their ancestors. At this time they already travelled in wagons, whereas those in the east had arrived as dwellers in black tents. It is possible that the spread of the Turks in southeastern Europe had impelled this movement westward, but if so, the Gypsies rode into greater trials and persecutions than those they were fleeing. From about 1600 A.D. onward, their treatment in western Europe was often barbarous.

Counting Gypsies is the most arduous known form of census taking, and no estimates as to their numbers can be accurate. There are perhaps nearly a million of them in the world, allowing at least 100,000 on either side for a probable error. Of these, over half a million are said to live in Rumania and Hungary. Spain has about 40,000, Italy over 30,000, and Russia nearly 60,000. Probably at least 150,000 live in Bulgaria, Macedonia, and Yugoslavia, while France has but 2000, Germany the same number, and the British Isles about 12,000. The total outside Europe, including Asia, Africa, America, and Australia, would perhaps amount to about 200,000.

The eastern European Gypsies have for the most part settled down,

[137] The reader, if he does not already know them, is invited to join the great company of Borrovians by acquainting himself with *The Romano Lavo-Lil*, *Lavengro*, *The Romany Rye*, and *The Bible in Spain*.

and many have lost their language. In Hungary less than 10,000 are still nomadic. In studying the racial characters of the European Gypsies, it will be necessary to distinguish between the nomads, who have in some countries preserved their original racial type with some degree of purity, and the settled Gypsies who have mixed extensively with the non-Gypsy population.

The most noticeable physical trait of the Gypsies, remarked everywhere from their first appearance to the present, is their dark pigmentation. In skin color this is often so dark as to exclude them, in popular estimation, from membership in the white race. Out of 52 Hungarian Gypsies Weisbach found 38, or 73 per cent, to have brown or brownish skin color; the others, light brown to yellowish. Glück, in a group of 66 from Bosnia, found 30, or 45 per cent, dark brown; 6, or 9 per cent, brown; 27, or 41 per cent, light brown; and only three light in a European sense. Lebzelter, with observations on the skin colors of 36 from Serbia, finds 6 brown, 29 yellowish, or yellowish-white, and one olive or brunet-white. Nomadic Gypsies noticed by the author in Albania seemed to be all or nearly all brown, nearer dark brown than light; the sedentary Gypsies of Tirana are also, as a rule, brown-skinned, although light-skinned individuals occur among them.

There can be little doubt that when the Gypsies arrived in Europe they were all or nearly all brown-eyed; today some 90 per cent of Hungarian and Serbian Gypsies still have unmixed brunet irises, with the majority dark brown to black. The head hair and the beard, as well, are almost always black among pure Gypsies, fine in texture, very thick on the head, and uniformly straight. Wavy hair seems to occur only among Gypsy-European hybrids. In all groups studied in Hungary and southeastern Europe, there are a few individuals with medium brown, light brown, or even blond hair, but these may with little doubt be considered mixtures.

The purest nomadic Gypsy groups are all short-statured, with means of 161 cm. to 164 cm.; the Hungarian Gypsies are taller, with a mean of 166.5 cm.; the "black" Bosnian Gypsies, living in a country of tall people, have a mean of 168 cm., while the "white" or palpably mixed Bosnian Gypsies, with a mean of 173 cm., are nearly as tall as the Bosnians themselves. In France they attain a stature of 166 cm., as high as that for Frenchmen, or higher; in England they are presumably nearly as tall as the English, as are the Stanleys and Coopers who live in America.

The purer groups of Gypsies have head length means of 188 to 190 mm., and breadths of 145 mm. or slightly over; their cephalic index means range from 76 among Black Bosnian Gypsies to 79 among those of Hungary. In France it is also 79, extraordinarily low for people living

in so brachycephalic a country. The heads of the Gypsies are usually low-vaulted, with a mean auricular height of about 120 mm.; their faces are small, with a total face height mean of 120 mm., a bizygomatic of 135 mm., and minimum frontal and bigonial means of 106 mm. Their facial index, 88, lies on the border of mesoprosopy and leptoprosopy, and their nasal index, 63, is leptorrhine. Their nasal dimensions, 52 mm. by 33 mm., are absolutely small. The nasal profile is, as a rule, straight.

In all facial features, as well as in their metrical position, the unmixed Gypsies are standard members of a small Mediterranean racial type; they could not have acquired this constant racial character anywhere between the Indus Valley and Hungary, since all Mediterranean forms encountered on the way are different. The nomadic Gypsies of Hungary, Rumania, and the Balkans, are still largely of this type; the sedentary Gypsies are gradually merging into the populations that surround them.

In western Europe the Gypsy is a hybrid, growing less Indian as one moves westward. The English Gypsies, in fact, to whose numbers have been added vagrant Englishmen, are in many cases hardly to be distinguished from the latter. The English Gypsies of America, who have given up horses for automobiles and who now sell the baskets made by Passamaquoddy Indians, look in some instances little different from brunet Yankees, although their English blood was accreted in England rather than in America. We have also in our country, however, many families of Balkan Gypsies, who retain their complete gypsy racial character, and who still wear their colorful clothing and jewelry, although they sleep in trailers rather than in caravans.

(19) CONCLUSIONS

The main conclusions to be drawn from the foregoing study of the Mediterranean World, in its stretch, a quarter of the way around the globe, from India to the Atlantic, may be expressed simply and briefly. In this zone the Mediterranean race is the one predominant human genetic factor. It abuts on the Veddoid group to the southeast, the negroid to the southwest, and the world of the descendants of hybrid Upper Palaeolithic hunters on the north and on the west.

The Mediterranean race, excepting those partially depigmented branches which escaped early to the north of the Mediterranean homelands and whose descendants we have already studied, is characteristically brunet, but in varying degrees, and when unmixed with Veddoids or negroids carries a minor mutative tendency to blondism.

The early divisions of the Mediterranean race noted in the skeletal material from as far back as the fourth millennium B.C. are still valid.

These divisions may be separated on several bases; notably, stature, degree of dolichocephaly, and facial cast, which is most easily expressed in terms of the nasal profile.

The Mediterraneans living in Asia are characterized, in varying degrees, by a prominence of the upper facial segment and by a convexity of nasal profile; those in Africa and Europe by a straighter facial plane, and a straight nasal profile. The Asiatic Mediterraneans tend to concurrence of eyebrows and heaviness of beard; those in Africa and Europe to a separation of the eyebrows over glabella, and a moderate beard and body hair development.

Historically, short Mediterraneans seem to have preceded tall ones in their wanderings out of typically Mediterranean territory. In view of the known antiquity of the tall varieties, this must be interpreted in terms of geographical position rather than of developmental sequence.

From the metrical standpoint the Mediterranean race is remarkably homogeneous. Different branches of the Mediterranean race, widely separated in time and space, may be identical or nearly identical in all measurable characters, but may differ profoundly in such superficial (in the literal sense) racial criteria as skin color, hair color, eye color, and hair form. Pigmentation, within the wider Mediterranean groups, is of little value in the estimation of long-range racial associations. The pigment map of Europe is truly a map of glaciation, and the racial types found within the inner zone of blondism have little in common other than a paucity of melanin. The Corded element in the Nordic, as it is isolated, is blue-eyed and brown-haired; its Asiatic counterpart is brown-eyed and black-haired. The Nordic proper and the smaller Mediterranean element in it which we call Danubian is ash-blond haired and gray- or mixed-eyed; its Mediterranean counterparts elsewhere are brown-haired and brown-eyed. Similarly the Atlanto-Mediterranean strain among the Irish and Scots is blue-eyed, although the hair color remains in many instances dark; here iris and skin depigmentation may have progressed in advance of the non-functional hair pigment. What it is that has made these races partially or fully blond, no one at present knows. But we do know that some of the changes must have taken place within the last five thousand years, since the separation of some of the blond branches of the Mediterranean race from their brunet counterparts cannot go back much farther.

The accretion of a small amount of negroid blood by the Mediterranean stock causes a frizziness of hair form; a darkening of skin color, which becomes extremely variable; a broadening of the nasal breadth; an increase in interorbital and biorbital dimensions; and often an increase in

facial and nasal lengths, as well as a tendency to nasal profile convexity. Vault dimensions and body dimensions change little.

The accretion of Veddoid blood causes a reduction in the head size, a tendency toward brachycephaly, an increase in browridges and in bizygomatic breadth, a narrowing of the lower face, expecially of the mandible, a narrowing of the nasal and orbital region, and a prominence of the nose. Especially noticeable is the acquisition of thick ringlet curls as an almost exclusive hair form.

The accretion of northern Palaeolithic blood of the Afalou variety causes an increase in bodily bulk, in heaviness of bone, in relative trunk size, and in head size. It causes a broadening of the head and face, and especially an increase in the size and prominence of the mandible. It causes the acquisition of a tendency toward blue-eyed, brown- or rufous-haired blondism, with freckling. A comparable action has already been observed upon the Nordic branch of the Mediterranean race in northern Europe and in Ireland.

What happens to the Mediterranean race when it is fused with central European and central Asiatic Alpine strains, and with mongoloid strains on the plains of central Asia, will be studied in the following chapter.

Chapter XII

THE CENTRAL ZONE, A STUDY IN REËMERGENCE

(1) INTRODUCTION

With the present chapter we enter upon the last west-east drive in our effort to deal systematically with the racial geography of living white peoples. We enter at the same time upon the most complex and, from the biological standpoint, the most difficult aspect of the white racial problem. The history of Europe north of the Pyrenees and south of the Baltic and of the Arctic fringe has been largely a matter of the penetration of food-producing Mediterranean peoples into territory held by food-gatherers of Mesolithic cultural tradition, the retreat and submergence of the food-gatherers, and their subsequent racial reëmergence. We have already witnessed the same process in the north, and in Britain, especially Ireland. We have also witnessed a similar process in Morocco and the Canary Islands.

In northern Europe and in Ireland, the reëmergence was of full-sized, unaltered Brünn and Borreby men; in North Africa of both reduced and unreduced Afalou survivors. One suspects, in studying individual living Irish, that the presence of occasional individuals of Alpine appearance may be due to a minor tendency toward size reduction in the Brünn stock, parallel to the reduction evident in some Riffians.

In central Europe, we shall deal with the Alpine race, a reduced Upper Palaeolithic type, which in its pure form is a medium to short-statured, laterally built, brachycephalic, short and broad-faced, short-nosed, relatively large-jawed, human variety. The perfect Alpine looks very much like the Germanic concept of a dwarf, the small men with snub noses and long beards who live in the mountains and forests, and who foster such poor unfortunates as the Princess Snow White.[1]

The thesis that the Alpine race is an *in situ* descendant of the Upper Palaeolithic men of France still remains unproved. The Mesolithic is a vast ten-thousand year gap in our knowledge of the racial history of Europe, and it is still possible that the Alpine race entered central Europe from the east during that time, or that it was reënforced by

[1] The production of *Snow White and the Seven Dwarfs* by Walt Disney in 1938 has made this physical type familiar, by means of caricature, to almost the entire American and western European public.

migrations from North Africa. It is also possible, and in fact more than likely, that the Alpine race represents a reëmergence within a reëmergence; that with the post-glacial climatic changes the shorter-statured, brachycephalic, short-faced, low-orbitted element within the heterogeneous Crô-Magnon and Afalou stocks asserted its selective superiority genetically over the taller, longer-headed and longer-faced elements, and that the Alpine race as such existed in Europe by the end of the Mesolithic; later it was pushed out and absorbed by the incoming Mediterraneans, through mixture with whom it subsequently made its second reëmergence. One difficult feature of this whole problem is that the Alpine race, in combination with certain other elements, produces a number of special mixed forms which help to complicate the racial picture.

A further complication is that the geographical frontier between the region of Alpine reëmergence and that of Borreby reëmergence is not clearly drawn; the two meet and overlap in the Low Countries and in Germany. In the east, free from Borreby competition, the Alpines follow the mountain chain into Asia Minor and southern Turkestan; on the plains of Russia and Poland it is a Lappish or Ladogan element which reëmerges.

The Mediterranean race is a foreigner on European soil. Only in Spain and Portugal, and the western Mediterranean islands, where the large Brünn and Borreby hybrids were never important; only in Great Britain, where geography yields little quarter to ancient survivors; and in eastern Norway and Sweden, where the land was relatively empty before their arrival, could Mediterraneans of either blond or brunet pigmentation survive as unaltered major populations on European soil. Europe owes her civilization to the Mediterraneans, but she owes her blood and bone, to an equal if not a larger extent, to the people who settled the continent during the last interglacial.

(2) FRANCE

The racial history of France is so integral a part of the racial history of western Europe as a whole that there is little need to review its earlier phases in detail. The Neolithic food-producers who first settled this country came largely from the south, from Spain and also from Italy; the Danubian invasions affected France little, if at all, in a direct racial sense. Megalithic invaders paid considerable attention to the whole western shore of France, and penetrated up the river valleys of the north, while Brittany was their especial stronghold. They were not, however, the first food-producers to arrive, as in Ireland, Scotland, and Denmark; hence their influence upon the subsequent population was relatively slight.

France was a cultural backwash during the Bronze Age; the farmers of Neolithic tradition tilled the valleys and plains, while hunters and gatherers of Mesolithic inspiration still wandered about the infertile uplands. Only in the northeastern part of France, adjacent to southern Germany, was there a Bronze Age civilization of any importance. The Iron Age brought with it invasions from the north of considerable magnitude; first the waves of Keltic peoples, and then of Germanic, culminating in the establishment of Charlemagne's Frankish empire. These invasions gave to the whole north of France a Kelto-Germanic racial cast, which has penetrated many other parts of the country. The Nordic infusion so produced has had a lasting effect upon the French racial composition.

Other movements of importance were the penetration of the Basques northward, as recorded in the preceding chapter; the arrival of the Northmen from Norway in what became, under their régime, Normandy; the earlier arrival of Saxons along the coast; and the settlement of Cornishmen in Brittany. In more recent times the infiltration of Italians into the Riviera is a racial movement of some consequence.

The Romans established themselves more firmly and with greater success in Gaul than in most of their colonies; the Romanized Kelts gave up their language for a popular variety of Latin, as did the Aquitanians in the southwestern portion of the country, and the Ligurians in the southeast. Greeks, Armenians, Jews, and other subjects of the Roman empire established themselves in Gaul in considerable numbers. The Parisian spirit of internationalism dates back to the Roman occupation. The survival of Romance speech through the blanket of Frankish German and of Norse in Normandy is a tribute to the strength of the Roman imprint.

Throughout her history, France has absorbed more than she has expanded; except for French Canada, she has never had a colony to which Frenchmen have gone in numbers to settle. In the same sense the territory of France is greater than her linguistic boundaries; on the corners of her domain are border provinces in which new foreign tongues have crept in, or in which older ones have long resisted absorption. Italian, in the southeast, is new; Basque and Breton date to the fifth century of our era—of the two the former is increasing, the latter slowly decreasing; Catalan in the Roussillon, so closely related to Langue d'Oc, is apparently static; in the north, Flemish, reaching westward from Belgium, is gradually on the decrease, as is German in Alsace. Although French is spoken by thousands of educated persons outside French territory as a second language, it is not an aggressive language within France itself. The total number of persons of native French citizenship within France whose mother language is not French is three and a half out of forty-two millions. At the same time four other millions

out of the forty-two are naturalized or unnaturalized foreigners. The emigration of Frenchmen is negligible.

At the turn of the twentieth century, France was probably the best documented of the larger European countries in an anthropometric sense. Since that time, however, almost no further statistical information has been collected; our sources are the same as those with which Deniker and Ripley worked. The material consists almost entirely of detailed studies of the distribution of a few characters, notably stature, the cephalic index, and pigmentation. The only new contribution that one can make lies in the field of interpretation.[2]

If we pass rapidly through the geographical distribution of stature, the cephalic index, and pigmentation, we shall have covered most of the existing information of an accurate nature. The mean stature of the French is about 166 cm.,[3] which is neither tall nor short, but inter-

[2] The old material has been ably summarized and interpreted by Professor Georges Montandon in *L'Ethnie Française*. His volume contains a complete bibliography of the older sources. Chief among those which have been used in the present section are:

Atgier, E. A., **BSAP,** ser. 4, vol. 9, 1898, pp. 617–637; ser. 4, vol. 10, 1899, pp. 171–199.

Aubert, **RDAP,** ser. 3, vol. 3, 1888, pp. 456–468.

Bouchereau, A., **Anth,** vol. 11, #6, 1900, pp. 691–706.

Bouchereau, A., and Mayet, L., **BMSA,** ser. 5, vol. 6, 1905, pp. 426–448.

Carlier, G., **BSAP,** ser. 4, vol. 4, 1893, pp. 470–476.

Carriere, G., **Homme,** vol. 2, 1885, pp. 334–337.

Carret, J., **MDSS,** vol. 21, 1883, pp. 1–108.

Chassagne, A., **RDAP,** ser. 2, vol. 4, 1881, pp. 439–447.

Collignon, R., **Anth,** vol. 1, 1890, pp. 201–224; vol. 4, 1893, pp. 237–258. **REAP,** vol. 7, 1897, pp. 339–347. **BSAP,** ser. 6, vol. 3, 1883, pp. 463–526; ser. 3, vol. 10, 1887, pp. 306–312; ser. 4, vol. 1, 1890, pp. 736–805. **MSAP,** ser. 3, vol. 1, fasc. 3, 1894, ser. 3, vol. 1, fasc. 5, 1895.

Debièrre, C., **BSAL,** vol. 5, 1886–87, pp. 129–149.

Durand de Gros, J. P., **BSAP,** ser. 2, vol. 4, 1869, pp. 193–218.

Garnier, M., **Anth,** vol. 24, 1913, pp. 25–50.

Grillière, **BSAP,** ser. 6, vol. 4, 1913, pp. 392–400.

Hervé, G., **REAP,** vol. 11, 1901, pp. 161–177.

Hovelacque, A., and Hervé, G., **MSAP,** ser. 3, vol. 1, fasc. 2, 1894, pp. 1–256.

Lagneau, G., **BSAP,** vol. 6, 1865, pp. 507–511.

Lapouge, G. V. de, **BSSM,** 1897, vol. 4, pp. 235–243.

MacAuliffe, L., and Marie, A., **Ethnographie,** No. 5, 1922, pp. 41–48.

MacAuliffe, L., Marie, A., and Thooris, A., **BMSA,** ser. 6, vol. 1, 1910, pp. 307–311.

Manouvrier, L., **BSAP,** ser. 3, vol. 11, 1888, pp. 156–173.

Papillault, G. F., **BMSA,** ser. 5, vol. 3, 1902, pp. 393–526.

Pommerol, F., **BSAP,** ser. 3, vol. 10, 1887, pp. 383–397.

Routil, R., **ZFRK,** vol. 5, 1937, pp. 177–181.

Topinard, P., **RDAP,** ser. 3, vol. 4, 1889, pp. 513–530; **JRAI,** vol. 27, 1897, pp. 96–103; **Anth,** vol. 4, 1893, pp. 579–591.

France more than almost any other European country stands in need of a new and complete anthropometric survey. The older surveys suffer in the technical sense as well as in the paucity of criteria studied.

[3] Figures for 1910.

mediate in relationship to other European peoples. France is divided into two principle stature zones by a slightly convex line which passes diagonally from Cherbourg to Marseilles, with mean statures of 166 cm. to 168 cm. lying to the northeast, and those ranging between 161 and 165 cm. on the southwest. Aside from this general scheme, taller people are found along the larger river valleys than in the hills, with one principal exception—the inhabitants of the northern slopes of the Pyrenees, from the Basques to the Catalan-speakers of the Roussillon, are taller than the people immediately north of them. In the northeast, in the taller region, there are stature modes of 164 and 168 cm.[4] The centers of relatively short stature in France are: the Maritime Alps, to the east of the valley of the Rhône, which acts as a wedge of newer population between the mountain nuclei on either side; the Massif Central, the classic Alpine country; the Perigord-Limoges region, including the Dordogne, which is the strongest outpost of dolichocephals in France; and Brittany.

It is curious that the Keltic-speaking Bretons are among the shortest people in France, and are, in fact, seven centimeters shorter than their kinsmen the Cornish who live directly across the Channel. A detailed stature map of Brittany by cantons shows that the jump from Cornwall is not as abrupt as it appears; [5] around the coast extends a thin band of maritime cantons with stature in the 164–165 cm. class, which gives way rapidly through a zone of transition to an inner nucleus in which the mean stature is 162 cm. This evidence, as well as that of the cephalic index, indicates that Cornish speech has survived in Brittany among a people to whom it is an adopted tongue, while it has died out in southwestern England whence it came.

Stature has increased to a certain extent in France during the last century, as it has in other parts of western Europe; one of the most striking examples of this change is seen in the mountainous region of Savoie, especially in the canton of Mt. Blanc.[6] In the five year period from 1807–12, the mean stature of some 12,000 men was 158 cm. Within this period, the stature seems to have been static. Between 1828 and 1837, the recruits from this same region had attained the mean of 162 cm., and in the 1872–79 interval they had reached 165 cm. Unfortunately there is no more recent data to trace the further history of this regional group. In the rest of France, the changes have been much less marked; the case of the Savoyards is apparently an example of diminishing isolation.

One of the most widely discussed subjects in French anthropology is that of the so-called *taches noires*, the black spots upon the stature map of

[4] Montandon, G., *op. cit.*, p. 64.
[5] Chassagne, A., **RDAP**, 1881.
[6] Carret, J., **MDSS**, 1883.

France. These are regions in which the people appear stunted, and whole villages and whole cantons are characterized by stature means well under 160 cm. These dwarfed areas seem definitely linked with poor living conditions and general retrogression. Broca, who studied such an area in Basse Bretagne, attributed this stunting to mineral deficiency, since it occurred mostly in regions of granitic soil.[7] Collignon,[8] who studied a second such spot in the Limousin Hills, on the corner of the four departments of Creuze, Corrèze, Charente, and Dordogne, invoked general poverty and misery. His proof that this stature reduction was environmental is seen in a comparison of means between sub-samples of 83 recruits from the canton of St. Pierre de Chignac. Of these 83, 53 who were born there and had always lived there had a mean of 159.5 cm.; 24 who were born in better country but raised in St. Pierre, 159.9 cm.; 15 who were born in St. Pierre and raised elsewhere, 163.7 cm.

Bodily proportions of the French are known to us only through two general series by Collignon.[9] The French as a group are not notably different from a general European mean; a relative span of 104 is greater than a Mediterranean condition, and resembles that of the western Norwegians, the East Baltics, and the Irish. The relative sitting height mean of 52.4 is not excessive, nor are absolute shoulder and hip breadths. On the whole, the resemblance is with northern Upper Palaeolithic survivors rather than Mediterraneans, which is to be expected.

The data on the cephalic index of the French, while covering smaller series than those for stature, are numerically fully adequate, and have been frequently discussed. France is a brachycephalic country, one of the most fully and intensely brachycephalic in the world. The mean cephalic index for the nation is 83.6, according to Collignon, which would be between 81 and 82 on the skull—in other words, it is about the same as it was during the Neolithic, judging by the relatively abundant cranial material reviewed in Chapter IV. Since most of the post-Neolithic invaders of France, who came in considerable numbers, have been dolichocephalic or mesocephalic, the present condition is evidence in itself of a prodigious absorption and reëmergence.

Two large zones in France are characterized by hyperbrachycephaly; indices of 86 and over are found in Auvergne and in Burgundy. The first center starts in Upper Gascony with the department of Gers, and extends eastward and slightly northward through Tarn-et-Garonne and Lot in the Guyenne, to Aveyron, Cantal, Lozère, and Haute Loire. This

[7] Thus anticipating Marett's work by half a century.
Broca, P., **BSA**, ser. 2, vol. 1, 1866, pp. 700–708.
[8] Collignon, R., **MSAP**, 1894.
[9] Collignon, R., **BSAP**, 1883; **Anth**, 1893.

is the famous Massif Central, the granite country, the refuge area of Alpines in their least mixed form. This area of maximum brachycephaly does not, however, correspond exactly with the center of short stature, which lies farther to the north and west; nor does it entirely merit the name "Auvergnat," because Auvergne forms merely the northwestern-most extremity of its distribution. Furthermore, it cannot be exactly correlated with any single geological or orographical phenomenon. The second zone of hyperbrachycephaly lies to the east and north of the first one; it is found in Savoie, eastern Burgundy, the Franche Comté, and Lorraine. The inhabitants of these regions differ profoundly from those in the first area, however; the Burgundians and Savoyards are much taller, and frequently blond.

Long-headed regional populations are scarce in France; true dolichocephals, with indices of 77 or under, are numerous only in the immediate region of Perigeux, in the Dordogne. Low mesocephals, with indices of 78 and 79, cover a wider zone around Perigeux, between the rivers Vézère and Dronne. Elsewhere relative long headedness, comprising indices between 78 and 81, is found in a number of regions: (a) the Channel departments, where Norman and Saxon blood is present, and here and there on the coast of Brittany. The Norwegian invaders, with a mean cephalic index of presumably 77, have pulled the regional mean down to 80 and 81 in most of Normandy; in Brittany, however, the Cornish invaders gave the inhabitants little beside their language. (b) the corridor reaching from Orleans to Bordeaux, through Marche, Poitou, and Berry; this has been a highway for invasions from the north since early times. (c) the Catalan-speaking region of Pyrenees Orientales. (d) the lower Rhône Valley, from Lyon to the Mediterranean, another much frequented corridor.

The rest of France, consisting of about half of the country, represents an intermediate condition in head form, with normal brachycephaly, the mean indices being between 82 and 85. In view of the skeletal history of France, and of the racial character of the living French, it is evident that a moderate brachycephaly is not, in this country, a normal racial condition, but an intermediate or mixed one, between end types which are genetically capable of reëmergence.

In France as in Norway, Denmark, and many other countries, there is a tendency for the cities to contain longer-headed populations than the surrounding country districts; in eight cities [10] the mean difference

[10] Bordeaux, La Rochelle, Pau, Bayonne, Tarbes, Rodez, Milhau, and Lyon. Calculated from:

Bouchereau and Mayet, 1905; Collingnon, R., **MSAP,** 1894; Durand de Gros, J. P., **BSAP,** 1869.

between the two is 1.86 index points. Since the birth-rate in the cities is low, and the cities drain the human surplus of the surrounding country districts, there must be a process of selection at play, here as elsewhere, which tends in the long run to raise the cephalic index mean not only in the country districts, but also in the cities as well. This process is particularly important in France where there has been since the beginning of the Neolithic a highly brachycephalic hinterland population to draw from. In Brittany the change seems to have been particularly profound, since the Iron Age crania from this country in no wise give promise of the present-day round headedness.[11]

Measurements of the head and face, and indices other than the cephalic, are extremely scanty.[12] Fortunately, however, they refer for the most part to the more brachycephalic element in the French population, which is of especial interest here. In the Alpine region par excellence, where the cephalic indices run to means of 85 and over, the head length means average about 184 mm., and the head breadth about 158 mm. The vault height mean is about 126 mm. These heads, with a cephalic module of 156 mm. (HL + HB + Aur. Ht. ÷ 3) are of moderate size for white people; they are much smaller than the heads of the Borreby brachycephals in Scandinavia and northern Germany, and a little smaller than one finds among brachycephals of equal index position in southern Germany. They are, however, comparable in size to those of Dinarics in the Balkans, and of Armenoids and Tajiks in Asia. Heads among all non-Borreby brachycephals, from France to Turkestan, are approximately equivalent in basic vault dimensions, whatever the differences in contours.

The French Alpine face, however, fails to maintain this level of similarity. The foreheads and jaws are both moderately broad, with minimum frontal and bigonial means of about 108 mm., as is the bizygomatic mean of 140 mm. These lateral dimensions exceed those of any Mediterranean group studied, and approach but do not equal the Borreby position. The French Alpine face breadth is equal to that of Tajiks, but less than that of some Dinarics in the Balkans, and of Armenoids.

[11] Vallois, M. H. V., *Les Ossements Bretons de Kerné.*

[12] Three series are most useful:

(1) MacAuliffe, L., Marie, A., and Thooris, A., **BMSA,** 1910. A series of 100 French soldiers.

(2) Hawes, C. H., a series of 51 French soldiers, mostly from Lozère, measured in Crete in 1905. This series has not been published previously.

(3) Papillault, G., **BMSA,** 1902. A series of 100 cadavers measured in the Paris morgue. This series is especially complete and accurate, but unfortunately there had been some shrinking of soft parts, or else social selection was important here, for the cadavers are smaller in many dimensions than living groups.

Aside from these three series, we have partial data on 22 other series, 17 by Collignon, and the others by Carlier, Carrière, Grillière, and Debièrre.

The total face height mean seems to be about 121 or 122 mm.; [13] the upper face height mean about 73 mm. These figures agree closely with those of the Tajiks of Turkestan, who are also for the most part Alpines; but fall far short of those for Dinarics and Armenoids. The Borreby brachycephals in the north do not have much longer faces. The French Alpines are mesoprosopic and mesene. Their nose height mean is about 53 mm., and breadth about 34 mm.; the nasal index approximately 64. Thus the noses are absolutely of moderate size, and moderately leptorrhine. They are, again, close to those of Tajiks, and much shorter than those of Dinarics or Armenoids.

To sum up this material, the Alpines of France, in the measurements and proportions of the head and face, seem to be smaller replicas of the Borreby people of northern Europe. They closely resemble the sedentary Iranian-speaking Tajiks of Turkestan, with whom we shall deal at some length later, and thus have possible relationships with a similar people far to the east. They furthermore differ greatly in facial dimensions and proportions from Dinarics and Armenoids in southeastern Europe and in western Asia. They differ profoundly from any group of Mediterraneans studied, and show a manifest affiliation to the general Upper Palaeolithic European group.

The one region of complete dolichocephaly in France, that of the Dordogne country, is characterized by unusually large head diameters. The mean head lengths of several cantons run as high as 196 and 197 mm., with the breadths at 150 mm. and greater.[14] The vaults are relatively low, being about 3 mm. lower than those of neighboring brachycephals. The bizygomatic means of the long-headed cantons are about 137 mm., as compared to 140 mm. for the brachycephalic cantons. This unusual head size, coupled with short stature, is unquestionably indicative of an isolated local type; but it is too great to refer wholly to a normal, small Mediterranean, Early Neolithic racial group. These dimensions remind one of the Mesolithic people of Téviec; and Ripley may not have been wholly wrong when he saw in the Dordogne dolichocephals a survival from pre-Neolithic times. The Mesolithic is still a period of uncertainty to the student of race, but the one thing that we do know is that it was, like all others before or since, a period of complexity. The Dordogne dolichocephals present a problem similar to that of the more primitive of the brunet dolichocephals of Wales.

The pigmentation of living Frenchmen, like their stature and cephalic

[13] There are no accurate total face heights available for France. I am basing this figure on French Canadian convicts in American jails, who seem to be of basic Alpine type. This material is taken from Hooton's extensive criminal survey.

[14] Collignon, R., **MSAP**, 1894.

indices, was subjected to extensive investigation during the last century, and there is no modern scale material for use in determining absolute standards. The most recent work, that of MacAuliffe and Marie on 6625 men from France as a whole,[15] finds but 4 per cent of black and near-black hair color, 23 per cent of dark brown, 43 per cent of medium brown, 14 per cent of light brown, 12 per cent of various degrees of blond, and some 4 per cent of reddish-brown and red. The virtual absence of truly black hair is notable, as well as the high degree of rufosity. The characteristic French hair color is a dark to medium brown, which often has a reddish glint; this color is typical of the Alpine race in its French manifestation.

The regional distribution of hair color in France follows closely that of stature. Although the position of the French in regard to hair pigmentation is intermediate between blond and black, the diagonal line from Mont St. Michel to Orleans, Lyons, and the Italian border divides the country into a northeastern quadrant, in which the hair is somewhat lighter than medium, and a southwestern, in which it is somewhat darker. High ratios of black and very dark brown hair are found not in the typically Alpine country, but along the slope of the Pyrenees, in Catalan-speaking country, and on the Mediterranean seacoast. Blond hair is commonest along the Channel, in regions settled by Saxons and Normans, in Burgundy and the country bordering Switzerland, and down the course of the Rhône. In northern France it seems to follow upstream the rivers which empty into the Channel. The hair color of the departments occupied by Flemish speakers, and of others directly across the Channel from England in Normandy, seems to be nearly as light as that in the southern English counties; the coastal cantons of Brittany are lighter than the inland ones, and approximate a Cornish condition. In the same way, the northeastern French departments are probably as light-haired as some of the provinces of southern Germany. Truly light hair is uncommon enough, and so placed geographically that it may be in large part attributed to the Keltic and Germanic migrations. But the hair of the pre-Keltic inhabitants of France can by no means have been wholly or even largely black; the intermediate brown hair shade of the Alpines, with its rufous and incipiently blond tendencies, must be ancient in France; it is comparable to the slightly blonder hair color range of the Borreby type, with its tendency to rufosity.

Eye color observations on the French are equally abundant and equally difficult to equate to standard shades and degrees of pigment.[16] Pure

[15] MacAuliffe, L., and Marie, A., **Ethnographie,** 1922. Older surveys which cover France geographically are those of Topinard and of Collignon.

[16] Most of the French observers use the terms "marron" and "chatain" to designate

dark eyes are apparently found among roughly 25 per cent of Frenchmen; [17] the departmental range runs from 14 per cent in Morbihan (Brittany) to Basse Pyrenees and Gers, with 41 per cent and 42 per cent, and thence to the very dark-eyed departments of Bouches du Rhône (57 per cent), and Alpes Maritimes (59 per cent). Out of 87 departments, 49 have between 20 per cent and 30 per cent of "dark" eyes.

The distribution of eye color in France follows roughly that of stature and hair color, but is less regular than either. Light eyes are especially numerous in the northeast, in the region of Keltic and Germanic influence, and in northwestern France, along the Channel from Flanders to Brittany. Topinard finds 25 per cent of blue eyes in these northern and eastern departments. In the Pyrenean departments, and along the Riviera, these blue eyes, which probably include light-mixed shades, sink below 15 per cent, but never below 10 per cent. Even in the departments where there is little historical or skeletal evidence of Nordic influence, there is always a large minority element of eye blondism. On the whole, the distribution of eye color differs from that of hair color in one particular: light eyes are relatively common in western France, especially in Brittany, in regions of dark hair color; while light hair is commoner in eastern France than the ratio of light eyes would warrant were the two strictly correlated. France repeats on a lesser scale the hair and eye color disharmony of northern Europe. The reason is the same in both areas; the eye blondism is partly Nordic, partly of Palaeolithic or Mesolithic derivation, while the really light hair is largely Nordic.

The foregoing summary of the detailed regional distributions of somatic characters among Frenchmen has made it clear that France, while more than anything else an Alpine country, is differentiated into a number of racial sub-areas. At the same time it is evident that in France as a whole, a number of distinct racial types may be easily distinguished among individuals. Starting on the regional basis, we have observed that the northern part of France, including the Channel departments and those stretching eastward as far as Burgundy, contains a population characterized by moderately tall stature, a variable but slightly fairer than intermediate degree of blondism, and a variable, sub-brachycephalic or brachycephalic head form. This population obviously contains strong vestiges of the Nordic invasions of Kelts and Germans, but in it fully

the commoner shades of brown eye color, presumably meaning dark brown and light brown, although Topinard pointed out that the only "chatain" that resembled a human eye color was one with a worm in it. Topinard and others observed eye color by standing at a distance and observing the total tone, although Bertillon advocated an accurate system which took into account the anatomy of the iris.

[17] This figure is obtained by combining MacAuliffe and Marie's "chatain" and "marron pur"; Topinard's "dark" class gives the same figure.

qualified Nordics of Keltic or Germanic aspect are rare. They are much commoner, however, in French Flanders, and in Normandy. Portrait material indicates that the Nordic element was especially strong among the old French nobility.

In northeastern and eastern France, in the region where relatively tall stature, relatively light hair and eye color, and extreme brachycephaly coincide, this partial Nordicism passes into a Dinaric or Dinaric-like condition. Here the cephalic index is as high as in the central Alpine country; the heads, furthermore, are no larger, and a Borreby element cannot be induced to explain the difference in stature and pigmentation. We must remember, however, that in the Neolithic period the stature of extreme brachycephals in this region was moderately tall, and that the accompanying Mediterranean crania were associated with much shorter stature.

It would seem that the infusion of Nordic blood produced by the Keltic and Germanic invasions helped to maintain this original stature level, or to reënforce it, while at the same time adding considerably to the local blond increment. A study of Savoyards on the basis of head form, head size, stature, and pigmentation [18] demonstrates that in a local group with a mean stature of 170 cm., there is no evidence of Borreby head size, and that two related elements seem to account for almost all of the sample; a Dinaric and a Noric, the latter being a blond brachycephal of general Dinaric morphology. The unavoidable inference is that the original Alpine type has absorbed not only Neolithic Mediterranean factors, but also Iron Age Nordics, in such proportions that the Alpine cephalic index level has been preserved, but that the facial characters have to a certain extent been taken over from the Nordics. In other parts of northern France, in the Seine and Marne valleys, for example, the Alpine element has not been strong enough to produce such a phenomenon consistently, although it has done so with individuals.

If the tall, relatively light-pigmented hyperbrachycephals of northeastern France have absorbed some Nordic blood without change of cephalic index, then it is possible that the shorter, darker ones of south-central France have absorbed various quantities of Mediterranean, since Mediterraneans have been present in this region since the beginning of the Neolithic, if not earlier. Among the French Alpines convex noses are common, and an approach to the Dinaric facial appearance; one wonders if this is not partly due to the absorption of Mediterranean blood. Alpine facial types of the classic variety, with a straight or concave nasal profile, combined with the Alpine abundance of beard growth, and the stiff but wavy, unruly Alpine hair, are by no means found among all Frenchmen who are metrically Alpine.

[18] Routil, R., **ZFRK**, vol. 5, 1937, pp. 177–181.

Here and there one sees a Frenchman of general Alpine type whose facial features, due largely to peculiarities of nose form and to malar prominence, approach a Lappish or mongoloid condition. The same may be seen occasionally in North Africa among Berbers. This must be attributed not to mongoloid invasions, but to the relationship between Lapps and other incipient mongoloids and Upper Palaeolithic Europeans in the Pleistocene. Ainu-looking Alpines are commoner than incipiently mongoloid ones.

Montandon, a keen observer of the French racial scene, proposes the following racial proportions for the French nation: Nordic, 1 per cent; Sub-Nordic, 30 per cent; Dinaric-like, 15 per cent; relatively pure Alpine, 30 per cent; Small Mediterranean (Ibero-Insular), 10 per cent; Atlanto-Mediterranean (Litoral), 10 per cent; Basque type, 1 per cent; others, 3 per cent. Although the Alpine increment receives only 30 per cent, it must be remembered that in the Sub-Nordic as in the Dinaric-like category, there is a strong Alpine element; furthermore, the Atlanto-Mediterraneans of the Pyrenees and the Riviera are strongly tinged with Alpine. If Collignon's head diameters are correct, then the small Mediterraneans of the Dordogne are not pure Neolithic descendants, but have absorbed a much older non-Alpine racial entity.

The final conclusions derived from this survey are as follows. France, notwithstanding her brilliant contributions to civilization and the international character which she, as a great cultural center, has assumed, was a culturally retarded, marginal area from the end of Mesolithic times until the Iron Age. At the same time, it has remained, since the end of the Pleistocene, a marginal or refuge area from the racial standpoint also, since the invasions of brunet Mediterraneans and of Nordics have together been less important here than in most European countries. In France the Alpine race, a smaller-sized and less blond replica of the northern Borreby race, has reëmerged as the principal racial element and can be seen in a relatively pure form. France is essentially an Alpine nation.

(3) BELGIUM

Belgium, with its 11,755 square miles, is a small country, but it is one which is important in European history as the meeting place of the Germanic north and the territories whose cultures and languages have been determined by contact with Rome. With 686 persons per square mile, it is one of the most thickly populated countries of Europe—its total population of 8,092,004 persons (1930 census) being much greater than those of many sovereign states many times its area.

This population has more than doubled in the last century; for in

1831 it was 3,785,814. This increase was due not to immigration, but wholly to internal reproduction. Belgium is, of course, one of the most highly industrialized countries of Europe—her soil is rich in natural resources, and heavy industries dependent on the abundance of mineral wealth are especially developed here. Industrialism is, however, nothing new to Belgium, for during the Middle Ages and succeeding centuries, Flanders was the textile center of Europe.

Belgium has only 42 miles of seacoast, which consists of sandy beach and dunes, with the shore going off so shallow that there are no natural harbors—all older seaports, such as Antwerp, Ghent, and Bruges, having been located inland on waterways. At the back of this sandy shore is a belt of flat country which is for the most part flush with the level of the sea or only a little above it; but for the natural barrier of the dunes and for man-made reinforcements, large parts of this land would be inundated at every exceptional equinoctial tide. This flat area is the plain of Flanders, famous for centuries as the battleground of Europe. Here the Romans fought Belgae and Germans; here the Spaniards and Austrians struggled in their time for possession of the Low Countries; here Napoleon met his Waterloo, which has a good Flemish name; and here, during the World War, Flanders suffered its latest, but probably not its last, invasion.

In the time of the Romans, the plain of Flanders was a swamp, impenetrable save to those who lived or sought refuge in it; it could never have held a large permanent population. During the Dark and Middle Ages a systematic drainage of the land and the building of dykes, combined with the natural action of the wind and waves blowing off the North Sea, made it a fertile plain eminently habitable by man. Its intensive settlement, therefore, dates largely from the last centuries of the first Christian millennium.

Bordering the plain of Flanders, on drier ground, there stood in Roman times a dense forest which served to reënforce the barrier of tidal swamps and salt marshes. This forest, called Sylva Carbonaria by the Romans, was an extension of the Ardennes Forest of northern France, and served as a barrier between those few Belgae who lived in moist freedom on the marshes, and the upland-dwelling Belgae and Gauls who adopted Roman speech, and became Walloons—the word Walloon being a cognate of the German Welsch, or English Welsh, a word which the early Germanic peoples applied to all strangers, much as the Greeks used the word *barbaroi*. The Walloon country is topographically differentiated from the Flemish plain; although its highest elevation is 2200 feet, it is covered with many hills and small valleys, and is forested, while the plain is almost treeless.

The Romans first learned of the Low Countries in the time of Caesar,

who found Keltic-speaking peoples in possession of all regions south and west of the Rhine, as far as Gaul, and this Keltic country thus included all of Belgium and much of the modern Netherlands. In 15 A.D. this country became, by imperial decree, Romanized Gallia Belgica.

About 300 A.D. the Franks began swarming over the Rhine into Roman territory, and gradually worked their way southward and westward. They took over the land as they went, except for the coastal strip north from the Scheldt to the Ems, which became Frisian property. The Frisians were allies of the Saxons, who had given the Franks the urge to migrate by driving them out of their former homes; hence the Frisians and the Franks were enemies.

Modern Flemish, the permanent linguistic heritage of the Frankish invasions of Belgium, is a branch of the west-Germanic language group, which includes three main divisions: (1) English (2) Frisian (3) Modern German dialects. The third category includes, as well as modern Platt-deutsch, both Flemish and Dutch.[19] In the sixth century certain sound shifts took place in German, starting in the mountains to the south and spreading north. The dialects which took over these shifts became High German, while those which retained their old form are Low German. Owing to this conservatism, the latter are closest to Frisian and to English. Flemish is a modification through Saxon and Frisian influences of Low Franconian, the speech brought into Belgium by the Franks. When the Franks entered the plain of Flanders, they found it nearly empty of people, hence it is no wonder that their speech took root there. In the then more populous Walloon country Latin soon reëmerged at the expense of Frankish, and has survived in the medium of an archaic Langue d'Ouil dialect.

When the comparative tranquillity of the Middle Ages arrived, Flanders, drained and populous, the most important of all the Low Countries, then included some of what is now northwestern France, the Belgian provinces of East and West Flanders, and the Dutch province of Zeeland.

Mediaeval Flanders was important because of its chartered towns with their skilled craftsmen, whose fame was renowned all over Europe. The most important of these towns were Ghent, Bruges, and Ypres—those which arose in Antwerp, Brabant, and Limburg were later, as were the Dutch towns. During the thirteenth century these Flemish towns had an industrial population of 100,000 to 200,000 people, most of whom were supported by weaving. There was a strong trade connection with England, whence they obtained their wool. In 1400 A.D. Flanders was the richest spot in Europe and probably in the whole world, and it is no

[19] Priebsch, R., "German Language," *Encyclopaedia Britannica*, thirteenth edition, vol. 11, pp. 778–783.

wonder that it excited the greed of foreign princes, who were willing to spill much blood in order to seize its fat revenues.

This picture of a fertile, prosperous, and populous Flanders accords ill with our previous portrayal of a swampy refuge, such as it was at the time of the Roman arrival. Although Flanders is much less affected by floods than are the Netherlands proper, still these have been of importance in Flemish history. Dykes had to be built before Flanders could be fully occupied, and even these dykes could not insure permanent safety. The twelfth century was an especially evil period in both Holland and Flanders; there were great disasters in both regions, and in 1111 A.D. many Flemish families moved to England to reside permanently and comfortably above high water. It was during the century after this series of inundations that Flanders attained its peak of prosperity.

During the sixteenth century, Protestantism spread into the Low Countries out of Germany, and became common in what is now the Netherlands, whereas it failed to dislodge Catholicism in the present Belgium. The attempts of Charles V and Philip II of Spain to suppress the heresy merely served to spread it; the gentle ministrations of the Duke of Alva and his executioners killed thousands, but there were many thousands more who survived. These inquisitorial activities had the effect of drawing a sharp line between a Protestant North and a Catholic South where the present boundary separates Holland from Belgium. It was not geography, nor a difference in culture or in language, but an accident of religion consolidated by persecution that caused the separation of Flemish Belgium from the Netherlands. Since the time of Caesar we have witnessed a southward movement of political and linguistic boundaries; in 57 B.C. both were identical with the Rhine. Migrations and gross population shifts have pushed the Germanic-Romance linguistic frontier southward to a natural barrier, where it has remained constant for many centuries.

The skeletal prehistory of Belgium, for all practical purposes, starts with the Neolithic and concerns itself almost entirely with the Walloon country. Here there was a strong brachycephalic concentration during the Neolithic, and some low-vaulted, short-statured Mediterranean groups as well; on the whole, the concentration of brachycephals was greater in Belgium than in most of France. The Neolithic brachycephals of the Walloon country were as large-headed as the Ofnet people, and thus approached the Borreby type in vault dimensions, but their faces were smaller than those of the latter. The Belgian Bronze Age and the pre-Frankish Iron Age are practically unknown skeletally, but the Franks are well represented. They belonged almost uniformly to a low-vaulted mesocephalic Nordic type, identical with that of the Iron Age Kelts.

A cranial series of modern age, not mentioned in the earlier chapters, is of particular interest. This is the Saaftingen series of 56 male and 38 female skulls,[20] taken from a Flemish cemetery on an island which is now submerged at high tide. The date of this cemetery is roughly 1500 A.D. The crania are uniformly brachycephalic, with a cranial index range of 79 to 92 for the male specimens, and 77 to 92 for the female. The mean cranial index for the males is 85.7. In size and in vault conformation they may readily be identified as pure Borreby type skulls. This identification extends to the facial dimensions and indices; the orbits are low, the nose mesorrhine, the face (136 mm.), and the jaw (104 mm.) wide. The problem of the racial character of the few inhabitants of the Flemish marshlands from Neolithic to Frankish times is perhaps solved; the swampy shores were apparently the home of a southwestward extension of the Danish Borreby people, who merged with Alpines in the highlands, and who, on their own marshes, maintained their racial identity in isolated spots until almost modern times.

Data on living Belgians are limited for the most part to the conventional surveys of stature, head form, and pigmentation, as in France. The Belgians as a nation are men of medium stature,[21] and the same is true of both the Flemings and the Walloons. In the 1880–82 conscript classes, Houzé found a mean stature of 166.1 cm. for Flemings, and of 164.8 cm. for Walloons. In those years the linguistic boundary was also a stature boundary, since the tallest Walloon province was shorter than the shortest Flemish province. In the 1902–07 classes, this difference had largely disappeared, since the mean for Flemings was 166.2 cm., and that for Walloons 165.8 cm. Belgian convicts measured in 1920 had a stature mean of 167.4 cm. for Flemings, 167.3 for Walloons. Thus regional stature differences in Belgium have been largely obliterated during the last half century.

Since the present stature level is about that of the Neolithic Belgian brachycephals and of the Belgae and Franks, any increase must be considered in the light of a return to an earlier level after an intervening period of depression, as in Scandinavia. Flanders was for centuries a recruiting ground for soldiers. Furthermore, adverse industrial conditions have been endemic there longer than in any other European country. Both factors may have tended, during the Middle Ages, to lower the mean stature both environmentally and by selection. On the whole the present-day Belgians are a little taller than Frenchmen, shorter than English

[20] DePauw, L., and Jacques, V., **BSAB,** vol. 3, 1884, pp. 191–260.

[21] Sources on Belgian stature are:
Houzé, E., **BSAB,** vol. 6, 1887, pp. 278–304.
Vervaeck, L., **BSAB,** vol. 28, 1909, pp. 1–60; vol. 34, 1920, pp. 50–90.

and Dutchmen, and about the same as southwestern Germans. Both Flemings and Walloons are moderately thick-set in bodily build;[22] their shoulders are broad, and their relative sitting height (53.5) great. Their arms, however, are not long, and their relative span, 103, is of an average European position.

The cephalic index seems to follow the linquistic cleavage to a greater extent than does stature.[23] In the Flemish-speaking country the mean index of Limburg, the easternmost province, is 78.9; this rises regularly from east to west, reaching 80.5 in West Flanders. In the Walloon country the lowest mean is 80.7 for Namur; Liege and Hainaut have means of 81.1 and 81.4; Walloon Brabant of 82.3. The province of Luxemburg, the southeasternmost of the kingdom, has a mean of 83.4. In the Flemish country, the lowest indices are those nearest Germany; the highest are near the coast, where pre-Frankish brachycephalic populations have been absorbed. The mean cephalic index of all Flemings is 79.4; of all Walloons 82.0.[24] The Flemings are on the whole mesocephals, the Walloons, except for the Luxemburg people, sub-brachycephals; the last named are the only true brachycephals.

The heads of all these people, except for the Luxemburg sample, are extremely large. The mean head length of Flemings is 194 mm., for Walloons 191.4 mm. Only the Luxemburg group has a mean of under 190 mm. If one selects the individuals from the different provincial samples with cephalic indices of 82 and over, so as to eliminate the influence of dolichocephals and mesocephals, and seriates for head lengths and breadths, one finds mean lengths of 190–192 mm. for all provinces except Luxemburg, where the mean is 186 mm.; the mean breadths of these selected heads are 160 mm. and over, except for Luxemburg, where the mean is 157 mm. The significance of this exercise is clear. Among both Flemings and Walloons, the major brachycephalic element is of Borreby size, while in Luxemburg only is truly Alpine brachycephaly in the French sense predominant. The head length and breadth means of the major group are nearly as great as those of the Baltic island of Fehmarn, the modern Borreby concentration point, while those of Luxemburg are similar to the dimensions of French brachycephals. The modern Walloons retain in unaltered form the cranial characters of their brachycephalic Neolithic ancestors. Today as during the Neolithic, they form a

[22] Vervaeck, L., **BSAB,** vol. 34, 1919, pp. 138–144.
MacAuliffe, L., and Marie, A., **CRAS,** Paris, 1921, vol. 172, pp. 284–286.
[23] Housé, E., **BSAB,** vol. 7, 1888, pp. 177–205; vol. 16, 1897, pp. 78–89.
MacAuliffe and Marie, *loc. cit.*
Provincial means cover series of 26 to 61 individuals, and are too small to be completely reliable.
[24] All available series have been pooled, making 362 Flemings and 366 Walloons.

southwestern periphery of the Borreby racial area, the center of which lies actually well to the south of Denmark.

The pigmentation map of Belgium [25] follows the same general pattern of the stature and cephalic index distributions. The Flemings are fairer than the Walloons, but not by much. Beddoe found 54 per cent of Flemings to have light eyes, as against 50 per cent for Walloons; dark eyes totalled 33 per cent among the former, 37 per cent among the latter. Both are well on the light side of intermediate in eye color. The Flemings have 52 per cent of medium brown hair, and 18 per cent of lighter shades, as against 37 per cent of brown and 13 per cent of light among the Walloons. The difference is not great, but it is consistent, and both groups are again of intermediate pigmentation. Among schoolchildren who still show their infantile dominance of light hair, 50 per cent or over in every province show both hair and eye blondism; in the Walloon provinces the ratio falls under 55 per cent, in the Flemish provinces it ranges between 55 per cent and 68 per cent. Since latent blondism may be detected more easily among children than among adults, the conclusion is that the Belgians of both linguistic groups contain both blond and brunet genetic factors; with the former slightly more important in the case of the Walloons, and considerably more in the case of the Flemings.

The Flemings are as light as most of the regional English populations; the Walloons on the whole are lighter than most of the French.[26]

An individual study of the inhabitants of a small, isolated Flemish village, Mendonck, in the canton of Lochristy in the province of East Flanders, shows us that local concentrations of the lowland Borreby racial type, as seen at Saaftingen, have not yet been completely dissolved. The mean stature of 60 males is 170.3 cm.; the cephalic index 81.2, with head lengths and breadths of 192 mm. and 156 mm. The bizygomatic diameter is 139 mm. These men are thus tall, sub-brachycephalic, and broad-faced; in pigmentation, 74 per cent have light skins which will not tan or have not tanned, having turned red on the exposed parts, like many English integuments. The eyes are 15 per cent blue, 73 per cent mixed, and 12 per cent brown; since Houzé followed Bertillon's method, these figures may be considered accurate. The hair is listed as blond, 63 per cent; light brown, 6 per cent; dark brown, 31 per cent. In other words, they are intermediate in hair and eye color, but on the light side. Occip-

[25] Beddoe, J., *The Races of Britain.*
Claerhout, J., **BSAB,** vol. 29, 1910, pp. 1–55.
Houzé, E., **BSAB,** vol. 16, 1897, pp. 78–89.
MacAuliffe, L., and Marie, A., **Ethnographie,** vol. 5, 1922, pp. 41–48.
Vanderkindere, L., **BSRB,** vol. 3, 1879, pp. 409–449.

[26] Direct comparisons may be made between Flemish and English through Beddoe's work, between Walloons and French through that of MacAuliffe and Marie.

ital flattening is common; the nasal profile is usually straight, and the nasal tip often snubbed.

Houzé's regressions make it clear that there are, in this Mendonck population, two clearly distinguishable types, a Frankish Nordic, with a stature of about 167 cm., and leptorrhine; and a Borreby type with a stature of 171 cm., and a messorrhine tendency. The tall brachycephals have a heavy body build, a broad face, a deep, heavy jaw, short upper facial segment, and heavy browridges. The Nordic type runs more to prominence and length of nose and upper face, and less to bony eminences in general. It is a more delicate, less massive type.

The conclusions derived from this study are not that the Flemings are Nordics and the Walloons Alpines, as has been frequently stated. The Flemings are, in fact, a people who are largely Nordic, and who derived their Nordic blood from their linguistic ancestors, the Franks. The Nordic sub-type of the Franks is that of the Keltic Iron Age. They have absorbed, especially in western Flanders, a certain amount of Borreby blood by intermarriage with the earlier inhabitants of the Flemish plain, who lived there in small numbers before this plain had been dyked and drained. The Walloons are the descendants of the large-headed highland population of the Neolithic, which was of mixed Alpine and Borreby derivation. To this has been added a Nordic accretion, and the actual metrical differences between Flemings and Walloons, while consistent, are not great. Only the inhabitants of the province of Luxemburg may be called Alpines in the strict sense, and their relationship is clearly with Lorraine and Burgundy.

(4) THE NETHERLANDS AND FRISIA

In the days when the country south of the Rhine was Keltic, those portions of the present kingdom of Netherlands which lie north of that river were occupied, along the coast and on the islands, by Frisians, and to the east of the Zuyder Zee by a Frankish tribe, the Batavii. Farther to the north and east lived the Saxons, south of whom was the main home of the Franks. Troubles between the Saxons and Franks impelled the latter to cross the Rhine and dislodge the Belgae; at the same time some of the Saxons settled in the northern Netherlands, in the Groningen country. Thus the northern half of the Netherlands had been Germanic territory since the earliest settlement of Germanic peoples in the country between the Rhine and the Elbe, which dates back to at least 500 B.C.; [27] the southern half shares its Germanic history with Flanders.

Linguistically the Netherlands is divided into two parts, the greater area, in which modern Dutch, a Frankish derivative closely related to Flemish, is spoken; and the lesser area in which the idiom is Frisian.

[27] Reche, O., **VUR**, vol. 4, 1929, pp. 129–158, 193–215.

Frisian is a waning language, since it is not official in any country. It once, however, was spoken all along the North Sea coast from western Flanders to Denmark. At present it is spoken only on the Frisian Islands and in the Dutch province of Friesland, as well as in a small section of Schleswig-Holstein. The Frisian Islands belong partly to the Netherlands, and partly to Germany. In the present section we shall overstep political frontiers in order to treat the Frisians as an ethnic unit.

The geography of the Netherlands has not, in historic times, been static; Dutch history has been an endless struggle between the inroads of the sea over gradually sinking land and human ingenuity.[28] Before the Netherlanders undertook the task of dyke-building, their ancestors made use of a less effective engineering device, the terp, or artificial habitation platform. The Iron Age farmers built these flat mounds out on land subject to flooding; on the terps they erected their houses, and in them buried their dead. At the times of the two semi-annual equinoctial floods, they crowded their livestock and all their perishable belongings on the tops of these edifices.

Although the terps would withstand ordinary floods, every now and then came an inundation which swept over their tops and destroyed much life and property. One such flood, dated by historians at 350 B.C., is believed to have isolated the West Frisian Islands from the mainland, and to have let the sea into the erstwhile fresh-water lake, which from then on became the Zuyder Zee. The Cimbri, the first Germanic invaders of Italy, are supposed to have migrated en masse from the Low Countries after this great flood, and their account of it greatly impressed the Romans. From then on disasters of this kind continued until the building of adequate dykes during the Middle Ages. Of all the Lowlanders, including the Flemings, the Saxons, and the Frisians, the Frisians have taken the greatest losses, and have had much of their land washed out from under their feet.

The total of pre-Iron Age skeletal material from the Netherlands is small,[29] but from what there is, coupled with a general knowledge of local archaeology, we may deduce that in the Neolithic period the southern provinces of Limburg and North Brabant were culturally and racially connected with Belgium, while in the northern and coastal provinces the Danish and North German cultures found a southern extension. Later the Bell Beaker people used the mouth of the Rhine as a route of entry into southern Germany, and also as a point of departure for Britain. It is likely that some, at least, of the Borreby blood which the Bell Beaker people absorbed before their departure for England came from this

[28] Van Overloop, M., **BSAB**, vol. 6, 1887, pp. 35–53.
[29] Van den Broek, A. J. P., **MEM**, vol. 6, 1930, pp. 401–417.

source. With the expansion of the Germanic peoples into the portion of the Netherlands lying north of the Rhine, the coastal fringe of Borreby people broke into isolated groups, and many of these early inhabitants were absorbed.[30] The arrival of the Germanic settlers, and the erection of the terps, which date from about 500 B.C. to 800 A.D., provided the first real skeletal evidence of consequence.[31]

There are two main areas in which terps were built; along the coast of Friesland and along that of Groningen. The two areas are not contiguous, being divided by the inlet known as Lauwers Zee. The former is called Friterpia, the latter Groterpia. The crania from both these regions are typically Nordic in the early Germanic sense; the Friterpians, with a mean cranial index of 73.7, were slightly longer headed than the Groterpians, whose mean is 75.4. Both of these skeletal groups are moderately high-vaulted, with mean basion-bregma heights of 136 mm.; in this dimension as in those of the face, they resemble very closely the crania of the early Anglo-Saxons who invaded England. Some of the Friterpian skulls are very low-vaulted, and show evidence of deformation; this is still practiced on the island of Marken in the Zuyder Zee, where the picturesque head-dress so admired by tourists is said to be the effective agent.[32] In both groups most of the individual skulls are of classic Germanic type; some, however, are mesocephalic, and incline morphologically in the direction of the Brünn race, or of the Borreby. These latter are commoner in Groterpia than in Friterpia. Part of this Palaeolithic strain may have been brought in by the Germanic ancestors, part absorbed locally.

During the Middle Ages the cranial form of the inhabitants of Groterpia and Friterpia, who had by now come down off their terps, changed gradually. The West Frisians from Friterpian country grew less dolichocephalic, until their mean cranial indices rose to 77; the Groningen people retained their lead of a single index point, with 78. These changes involved the vault almost entirely, and had little effect on the face.

A series of crania from Zuid Beveland, the largest island of the province of Zeeland, comes from a section of the island which was swamped by floods in 1530 and 1532; they date from the period immediately before this disaster. These skulls are markedly brachycephalic,[33] and support

[30] The evidence for the early existence of a coastal fringe of Borreby people reaching from Denmark to Flanders consists largely of survivals. Owing to the subsidence of the land along this shoreline, much of the early skeletal evidence must lie under water.

[31] Folmer, H. C., **AFA,** vol. 26, 1900, pp. 747–763.
Nyessen, D. J. H., *The Passing of the Frisians.*
Reche, O., **VUR,** 1929.

[32] Barge, J. A. J., **PIIA,** session 3, Amsterdam, 1927, pp. 63–71.

[33] Sasse, A., **AFA,** vol. 6, 1873, pp. 76–83.

the evidence of Saaftingen that the Scheldt region was a pocket of survival for round-headed coastal people well through the Middle Ages.

The living Netherlanders, as is to be expected, belong more to a Nordic type than to any other, while large-headed brachycephals form an important minority. The stature of Dutch conscripts has increased from 164 cm. in 1863–67, to 171 cm. in 1921–25.[34] At its present level Dutch stature shows marked regional values; Limburg, which extends southward between Belgium and Germany as a Dutch appendage, has a mean of 168 cm., comparable to that of Flemings. North Brabant's mean is 169 cm., and Zeeland's 170 cm. The coastal provinces north of the Rhine are taller than those inland; the tallest being Friesland, with a mean of 172 cm.

The mean cephalic index of the Netherlands is 80.3. The regional variation is slight, but geographically significant; the West Frisian Islands have indices of 79, and in general the northern coast is the longest-headed part of the country, while the southern and eastern provinces have higher means.[35] The general picture of the Dutch as a predominantly Nordic people who have absorbed a certain amount of Upper Palaeolithic European blood is substantiated by a detailed study of 70 Netherlanders measured both at home and in America.[36] This group, with a mean stature of 173 cm. and a cephalic index of 79, fits almost exactly into the metrical category of the British and of Americans of British descent. The dimensions of the head and face are definitely Nordic, with a suggestion of the Palaeolithic strains in a number of measurements, notably the bigonial mean of 108 mm.

The pigmentation of the Dutch as a group is predominantly blond; the inhabitants of the provinces north of the Rhine may be included in the lightest zone of Europe.[37] South of the Rhine, brown and dark-mixed eyes, which are rare in the north, rise to 30 per cent and over of the population, and are especially numerous in Zeeland and Limburg. The commonest hair color among the Dutch is brown, of light to medium shade, but golden blondism is common in the north, especially in Frisian country.

The Frisians have been studied in more detail than the rest of the

[34] Van den Broek, A. J. P., **KAWA**, vol. 30, #6, 1927, pp. 685–694; **PIIA**, session 3, Amsterdam, 1927, pp. 211–215.

[35] Barge, J. A. J., **MEM**, pp. 284–285.
Van den Broek, A. J. P., **MEM**, vol. 6, 1930, pp. 401–417.
Sasse, J., **BNAV**, 1913, pp. 8–11.
The recent government survey of the C. I. in the Netherlands should soon make it possible to treat this subject with greater clarity.

[36] Steggerda, M., **AJPA**, vol. 16, 1932, pp. 309–337.

[37] Beddoe, J., *The Races of Britain*, p. 203.
Bolk, L., **BSAP**, ser. 5, vol. 5, 1905, pp. 578–586.
Reche, O., **VUR**, vol. 4, 1929, pp. 129–158, 193–215.

Netherlanders; the consideration of this group leads us outside Dutch territory, however, for the Frisians, like the Basques, are an ethnic unit but not a nation. They differ from their neighbors not only in language, but also in a number of cultural traits which they possess in common. There are three groups of Frisians; the West Frisians, who occupy the province of Frisia in the Netherlands and the islands from Texel to Rottumeroog, which stretch between the point of North Holland and the mouth of the Ems; the East Frisians, who live on the islands lying between the Ems mouth and the Weser, from Borkum to Wangeroog; and the North Frisians, who live partly on the mainland of Schleswig-Holstein, between Tönder, which is now in Denmark, and Husum, and partly on the islands of Norstrand, Pellworm, and the Halligen. The islanders of Sylt, Föhr, and Amrum are only half Frisian; their dialect contains Saxon elements, and the islanders consider themselves more Saxon than Frisian.

The earliest known home of the Frisians was the island chain of the present West and East Frisia, and the adjacent portions of the mainland. The North Frisians migrated to their present location about 800 A.D., partly taking over abandoned country, and partly absorbing the earlier inhabitants, the Ambrones, whose name has been preserved in that of the island of Amrum. All of the Frisian Islands have suffered from sinking and erosion; many islands have disappeared and others undercut to fractions of their earlier area.

The Frisians were important historically for a few centuries between the Anglo-Saxon invasion of England and the reign of Charlemagne, to whom they submitted in 785 A.D. During this period they were far-wandering seafarers, and engaged in trade with all the countries bordering on the North Sea, and were especially active in the slave trade. The development of the Viking sea power farther north began only after the collapse of the Frisian hegemony.

All three Frisian groups have been subjected to careful anthropometric study; in North Frisia the Wiedingharde and Bökingharde mainlanders,[38] in East Frisia the Spiekeroog islanders,[39] and in West Frisia the Terschelling islanders,[40] have been thoroughly investigated. In all three, the anthropometric results are much the same. They are all tall, with mean statures of 170 cm. or over; all groups run long-legged, with relative sitting height means of 51, broad-shouldered and wide-spanned, with relative spans of 106 and 107.

They are very large-headed, with mean head lengths of 194 mm. to 198 mm., and breadths of 155 mm. to 159 mm. The West and East

[38] Saller, K., **JNVH,** vol. 16, 1929, pp. 119–139.
[39] Ruhnau, K., **ARGB,** vol. 16, 1925, pp. 378 ff.
[40] Sasse, J., **BNAV,** 1913, pp. 8–11.

Frisians are mesocephalic, with mean cephalic indices of 79.5; the North Frisians are sub-brachycephalic, with means of 81.5. The vault heights run from 123 to 125 mm., moderate in view of the great length and breadth dimensions. The faces are large, with minimum frontal diameter means of 108–112 mm., bizygomatics of 140–143 mm., and bigonials of 108–110 mm. The faces are quite long (125–130 mm.) in the West and East Frisian samples, and shorter (120–124 mm.) in North Frisia. Noses are large, and extremely leptorrhine. The nasal profile is straight or wavy in about half the individuals; concave in 15 per cent, and convex in 35 per cent. The hair is blond to medium brown, especially the latter (Saller-Fischer chart A–O), in over 60 per cent, except for the North Frisian parish of Bökingharde, where it is darker; red hair runs as high as 7 per cent on Spiekeroog. The eyes are pure blue or light-mixed in 70 per cent to 80 per cent of instances. The Frisians are among the blondest people in the world.

Metrically and morphologically, the Frisians belong for the most part to a well-marked type, which is very Nordic in the usual sense of the word, but which, in the sense employed in this book, is something different. The Germanic Nordic element is without doubt strong, but the excessive size of head and face, and particularly the facial breadths, make it clear that the old Upper Palaeolithic elements, Brünn as well as Borreby, have been incorporated in quantity. In view of the great facial lengths and the ruggedness and angularity of the facial profile typical of Frisians, and of their spare body build, one is led to postulate an excess of Corded factors as well.

The West and East Frisians conform most frequently to the ideal Frisian form, a long, angular, large-boned type with large hands and feet, a large, bony head and face, with a prominent jaw, thin lips, a long, straight nose, heavy browridges, and a high forehead. In late middle age the features, sharply cut in youth, tend to grow coarser, and the body heavy. In North Frisia, where the Frisian settlement is younger than elsewhere, shorter, smaller-framed men, hook-nosed, with retreating foreheads, and often with darker hair and eye color, form a second type, which is palpably Dinaric and may be a survival of the Bronze Age. In all Frisian countries, but particularly in North Frisia, a third type is found as a minor element, a familiar Borreby derivative; it consists of tall, heavy men, whose bodies tend to fat, with round, red faces, and noses which are often snubbed or concave. This type is frequently very blond, and fairer-haired than the more usual Frisian type. In North Frisia its especial frequency is attributed to Jutish infusion from the North.[41]

The study of the Frisians leads us to the conclusion that the survival of overgrown Upper Palaeolithic types in quantity is not confined to Norway

[41] Lehmann, O., **VUR**, vol. 1, 1926, pp. 7–19.

and Ireland, but is equally in evidence along the Dutch and German shores of the North Sea. In all of the so-called Nordic racial area of northwestern Europe, a relatively complex racial situation is encountered in which classical Nordic elements are rarely found in as stable a form as in eastern Norway and in Sweden. Among Frisians, at least, there is evidence that the Brünn and Borreby elements, and the Corded as well, have tended to reëmerge and to form local recombinations. The study of the Frisians will serve as an introduction to the racial problems of northern Germany.

(5) GERMANY

The racial history of Germany is long and complicated, and Germany in its present geographical form (even before the annexation of Austria and the Sudetenlands), has never been a unit in the racial sense. In the political sense its unity dates back only to Frederick the Great and Bismarck; its modern social solidarity only to Hitler. Its Palaeolithic racial history is inseparable from that of the rest of Europe, its Mesolithic history limited to the discovery of the brachycephalic crania of Ofnet and Kaufertsberg, and of the Borreby-type skulls dredged from the Baltic clay and peat. During the Neolithic, racial and cultural influences came to Germany from many quarters; the Michelsberg culture in the Rhineland was a northern *Schweinhirtenkultur* periphery, while in Saxony and Thuringia Danubian pioneers pushed their clearings to the west. Silesia and northeastern Germany later became great Corded headquarters, while under the combined Corded and Megalithic tutelage, the "Nordic" culture arose in all of northern Germany, and its influences spread to the Danube. With the arrival of metal, or before it, the Corded people had become important in Saxo-Thuringia, and the Bell Beaker people appeared soon after on the Rhine. Thus before the onset of the Bronze Age the German stage already held a full complement of *dramatis personae*, some of whom were destined to give curtain calls, and others to be thrust into the wings before the end of the first act.

The cast included members of the following racial types: a small, low-vaulted Mediterranean of North African provenience, commonest in the upper Rhineland, where it still appears sporadically; the ordinary Danubian Mediterranean, the Megalithic Atlanto-Mediterranean, the Corded, the Borreby, probably the Alpine, and the Bell Beaker Dinaric. Furthermore, a considerable trace of the Brünn race remained in solution in the northwestern part of the country. Before the appearance of the full Bronze Age, the Corded and Danubian elements had taken the center of the stage on the plains, while Dinaric, Borreby, and Alpine brachycephals occupied the northern slopes of the Alps. During the Bronze Age the Corded people became particularly important in Saxo-Thuringia, while

Aunjetitz Nordics were the principal people farther east, and the descendants of the Bell Beaker people were in control of the upper Rhine. Eastern Germany, along with much of Poland and parts of Ukraine, became the center of the Urnfields cultures, and at the same time a Nordic center, from which cremation spread in the Late Bronze Age.

In the early Iron Age Hallstatt Nordics spread into southern Germany; in Württemburg, Bavaria, and the Bavarian Palatinate are many Nordic skulls in association with the brachycephalic crania of the earlier inhabitants. Throughout the Hallstatt Iron Age, however, the highland zone of southern Germany, despite Nordic infusions, clung to its brachycephalic population, although on the plains farther north, pure long heads held complete sway. In the Hallstatt cemeteries of Switzerland, the majority of the crania are brachycephalic, while in Austria, a Hallstatt Nordic nucleus, the mountain regions kept, even at the height of the Hallstatt efflorescence, a strong basic population of Dinaric brachycephals.

The Kelts, who arose in southwestern Germany and who spread thence during the La Tène Iron Age, may have come originally from the Urnfields country during the Bronze Age, but their acquisition of a round-headed element took place in Germany. The Helvetii, the principal Keltic people of Switzerland, bore the brachycephalic head form of their pre-Keltic predecessors.

Following the northward movement of some Nordic people in a late Bronze Age or Hallstatt stage of culture, and under Hallstatt inspiration, the Germanic racial and cultural amalgam arose, with its center in Scandinavia, and its southern periphery including the lowlands which stretch from the mouth of the Elbe across to the southern Baltic shore. The Germanic Nordic type which occupied this southern area, and which was well exemplified by the Anglo-Saxons and Frisians, was a combination of ordinary Iron Age Nordics with Brünn and Borreby elements, and with a larger ratio of Corded than the original Nordic formula required. It was a heavier, coarser type than the Nordic which took root in eastern Norway and in central Sweden, but perhaps not at that time quite as much so as that which developed in western Norway, and which it most closely resembled. We have already studied its closest living representatives in both England and Frisia.

The Germanic peoples who participated in the Völkerwanderung were divided into two groups, both on the basis of language and on that of chronology; the East Germans, including the Goths, Vandals, Gepidi, and Burgundians, expanded early in the Christian era and moved well beyond modern Germanic borders, and hence do not concern us here. The West Germans, including the Angles, Saxons, Frisians, and the Germans proper, were later to spread and were less theatrical, but pro-

duced more lasting results. It was the Germans proper in particular, the Franks, the Chatti, whose descendants are the Hessians, the Bajuvars or Bavarians, the Alemanni, and the Thuringians, who settled most of modern Germany. Those Franks who did not push on to Belgium and France occupied southwestern Germany, the Chatti settled in the modern Hesse, the Alemanni went to Switzerland and Austria, the Bajuvars to Bavaria, the Thuringians to Thuringia and Bohemia. The Germanic settlement of Austria was a complicated process, involving Alemanni, Bajuvars, Lombards (who were West Germans), and Goths, as well as some Huns and Slavs.

The Chatti and the Thuringians preserved their original Nordic head form for some time in their new territories, but the Bajuvars incorporated a number of indigenous brachycephals into their ethnic body, while the Alemanni, both in Baden and Switzerland, early lost their Germanic racial identity by physical absorption into the previously Keltic-speaking local populations. We have already seen that those Franks who moved to Belgium kept, in Flanders, much of their Nordic character.

The Slavs, who for a few centuries after their westward expansion occupied much of the lowland country of central and eastern Germany, were at that time dolichocephalic or mesocephalic for the most part, and resembled the earlier Kelts in their usual physical type, while falling into the general Nordic category. For this reason the subsequent brachycephalization of much of this area cannot be attributed, at least wholly, to them.

The movement of the Saxons southeastward into the present Saxony and onward to the Sudetenlands was a later phenomenon than the Völkerwanderung, but really an extension of it. The same is true of the eastward expansion of Germans beyond Germanic borderlands, which began about the twelfth century. The *Drang nach Osten* is an ethnic movement of some antiquity, caused by vital demographic forces, and not a modern political affair. The linguistic map of central and eastern Europe is spattered with patches which designate German villages and whole German sections, in Czechoslovakia, Poland, Hungary, Jugoslavia, Rumania, and the Ukraine, and reaching as far as the Volga German colony on the border of Asia. Place names such as Leipzig, Wörms, and Neu Danzig give ample evidence that these colonies had their origins in different parts of Germany. These German exiles remain unabsorbed in their new countries, and their fidelity to German speech and German culture presents a difficult political problem.[42]

In view of the history of Germany, it is not surprising that the modern

[42] See Keiter, F., *Russlanddeutsche Bauern.*
Hermann, A., *Die deutschen Bauern des Burgenlandes.*

German people should be divided regionally on a racial basis. Since the only part of the Reich which is old Germanic country is the extreme northwest, one should expect to find early Germanic racial types in the numerical ascendancy in that region alone, but their occurrence as individuals is to be expected everywhere, and is so found. The tremendous slaughtering of Saxons by the Franks, the devastating wars which took place in Germany during the Middle Ages, the Thirty Years War and the Hundred Years War, the campaigns of the Swedes and of Napoleon, the constant drainage of German manpower as mercenaries in armies far afield, have, when added together, formed a selective force of great magnitude. In many campaigns whole villages have been destroyed, whole populations massacred and replaced. Germany, especially the German plains, has suffered much from war, and this suffering has given the older elements in the population, those socially least affected by war in the sense of survival, full opportunity to reëmerge, an opportunity of which they have availed themselves. The temporary ascendancy of North German Nordics in most of Germany during the centuries which followed the settlement of the West Germanic tribes was not of long duration.

The problem of South German brachycephaly is a part of the general racial problem of the Alpine highland region, and cannot be separated from a consideration of the same subject in Switzerland and Austria. Cranial collections from Bavaria, from Switzerland, and from the Tyrol all show the same characteristics in varying proportions. All are predominantly if not wholly brachycephalic, with cranial index means ranging from 82 to 86; all fall metrically into the moderate vault Alpine-Dinaric class, and all contain both planoccipital and curvoccipital skulls.[43] There

[43] The literature on this subject is exhaustive, and only a few references can be given here. Some of the most important works are:

Frizzi, E., **MAGW,** vol. 39, 1909, pp. 1–65. **KDGA,** vol. 41, 1910, pp. 5–8.

Höfler, M., **RAUB,** vol. 4, 1881, pp. 85–97.

Holl, M., **MAGW,** vol. 14, 1884, pp. 77–116; vol. 15, 1885, pp. 41–76; vol. 17, 1887, pp. 129–152; vol. 18, 1888, pp. 1–24.

Mühlmann, W. E., **ZFMA,** vol. 30, 1932, pp. 382–405.

Pittard, E., **REAP,** vol. 8, 1898, pp. 86–94, pp. 223–231; vol. 9, 1899, p. 186; vol. 10, 1900, p. 136; vol. 20, 1910, pp. 24–27.

Pittard, E., and Reverdin, L., **ASAG,** vol. 4, 1920, pp. 107–127, 287–330.

Ranke, J., **BAUB,** vol. 5, 1884, pp. 53–205; vol. 12, 1897, pp. 127–164.

Reicher, M., **ZFMA,** vol. 15, 1913, pp. 421–562.

Ried, H. A., **BAUB,** vol. 18, 1911, pp. 1–112.

Rutimeyer, L., and His, W., *Crania Helvetica.*

Shapiro, H. L., **APAM,** vol. 31, 1929, pp. 1–120.

Tappeiner, F., **ZFE,** vol. 31, 1899, pp. 201–236.

Toldt, C., **MAGW,** vol. 40, 1910, pp. 67–100, 197–230.

Wacker, R., **ZFE,** vol. 44, 1912, pp. 437–524.

Wettstein, E., *Zur Anthropologie und Ethnographie des Kreises Dissentis.*

Zuckerkandl, E., **MAGW,** vol. 14, 1884, pp. 117–128.

can be no other interpretation of this material, which covers several thousands of well-documented crania, than that they are the skulls of Alpines and of Dinarics, two variant brachycephalic racial types which formed the predominant population of the Alpine mountain system before the Germanic migrations and which have survived all invasions to which they have been subjected. The series of South German crania of varying date show that this reëmergence has taken place gradually and consistently from the time of the Frankish conversion to Christianity to the present.

One exception to this rule that the principal cranial types are Alpine and Dinaric is found in a series of skulls of sixteenth to eighteenth century date from various cemeteries in Baden.[44] These are brachycephalic, with a mean cranial index of 83, but possess the great cranial length of 189 mm. Other measurements and indices show that these crania are broad-faced and low-orbitted, and belong for the most part to a Borreby category. One will recall that the brachycephaly of this same region during the Bronze Age was also partly of a Borreby type, in mixture with Beaker Dinarics. Baden is on the northwestern periphery of the Alpine world.

Modern anthropometric research on the living in Germany has taken the form of intensive studies of small, often isolated villages and districts, rather than large, sweeping surveys. Since the villages and districts studied have been selected so as to represent the most varied populations in Germany, a review of some of the most distinctive will suffice to show the racial character of the principal divisions of the country.[45]

Before starting this review, however, it may be advisable to point out that in all parts of Germany the mean cephalic index is 80 or higher, with two exceptions; among the East Frisians already studied, and among the Hessians and the occupants of the eastern bank of the Rhine in Rhenish Prussia as far north as Dusseldorf.[46] In both these regions the mean is 79. Along the southern Baltic shore, from Mecklenburg to East Prussia, the mean is 82,[47] so that no Nordic population in a strict sense may be said to exist there. The lowest cephalic indices in Germany are western in distribution, rather than northern, and are contiguous with the relatively long-headed populations of Flanders and the Netherlands.

Tall stature is characteristic of most Germans; it is concentrated, however, in the northwestern, western, and southern parts of the country, and

[44] Mühlmann, W. E., **ZFMA,** 1932.

[45] Anthropometric research in Germany has been so extensive since the World War that it is impossible to give a complete or even representative bibliography. Perhaps the most notable contribution has been the series of monographs entitled *Deutsche Rassenkunde,* edited by E. Fischer, and published by Gustav Fischer in Jena. The series was started in 1929; at the time of writing, 16 volumes had appeared.

[46] Huck, M., **Anth,** vol. 29, 1918–19, pp. 459–504.

[47] Parsons, F. G., **JRAI,** vol. 49, 1919, pp. 20–35; Klenke, W., *Die Deutsche und ihre Nachbarvölker.*

is less marked in the center and east. Brünn, Borreby, and Dinaric statures are all tall, and the local form of Alpine, like that of northeastern France, is not short. Moderate statures come largely from eastern European sources. The Germans as a nation are blond or of light-mixed pigmentation. There is a decrease in blondism from north to south, culminating in the mountains of Bavaria where the hair is characteristically dark and the eyes mixed. From the distributional standpoint the most remarkable thing about Germany in a racial sense is the large head size typical of much of the country, and of the north and west in particular.

The samples studied in northwestern Germany may be divided into two groups, Fehmarn Island [48] and all others.[49] The island of Fehmarn, lying in the Baltic south of the Danish archipelago, some fifteen miles across the Fehmarn Belt from the Danish island of Laaland, is separated from the Schleswig-Holstein mainland by a narrow sound. The population of Fehmarn is derived from an old Wendish element, dating from the time of the Slavic expansion, to which have been added Low Saxons and immigrants from Dithmars, the southwestern coast of Schleswig-Holstein, just south of North Frisia. There is also without doubt a considerable survival of genetic factors from the pre-Wendish occupants. In modern times the Fehmarn people have been moderately isolated, enough so to have developed and preserved a local type of their own.

This type, in brief, is the nearest living approximation to the Borreby race of the Mesolithic. The Fehmarners are very tall (173.6 cm.), broad-shouldered, wide-spanned, but at the same time long-legged; their heads are of prodigious size, with a mean length of 194 mm., breadth of 162 mm., and heights of 129 mm. Despite the great length, which exceeds that of long-headed Nordics, the cephalic index mean is 83.6, fully brachycephalic. The face is as large proportionately as the vault; the three principal breadths, minimum frontal, bizygomatic, and bigonial, being respectively 110 mm., 145 mm., and 112 mm. In view of these excessive diameters, the total face height of 122 mm. is relatively short, and the facial index is euryene. The nose is moderately large (56.5 mm. by 35.3 mm.), and the nasal index leptorrhine (62.4). It is safe to predict that no regional population of any numerical size will be found on the continent of Europe which will exceed the cranial and facial dimensions of the Fehmarners.

Fifty per cent of the Fehmarn males studied were thick-set and heavy-bodied; a lateral or somatic constitutional type is common here. One-

[48] Saller, K., *Die Fehmaraner.*

[49] Keiter, F., *Schwansen und die Schlei.*
Klenke, W., and Scheidt, W., *Niedersachsische Bauern.*
Saller, K., *Süderdithmarsische Geestbevolkerung.*
Scheidt, W., and Wriede, H., *Die Elbinsel Finkenwärder.*

fourth of the group has a straight, presumably flattish occiput, despite the great vault length; a planoccipital cranial form is a strong minority trait. Half of the noses have straight or wavy profiles; 30 per cent have convex, and 20 per cent concave. The photographs indicate that heavy brow-ridges and exceptionally sloping foreheads are common.

The hair is brown as a rule among adults; 54 per cent could be classed as dark brown (Fischer #27, 4–7); the rest are divided between golden and ashen shades of light brown and blond. The hair as a rule darkens steadily throughout life; at the onset of senility, 80 per cent of all non-white hair observed was dark brown, as against 7 per cent at the age of 6 years. By contrast, the eyes are very light; less than 3 per cent have brown or dark-mixed shades (Martin #1–6); 78 per cent have eyes which are pure light or almost entirely so (Martin #13–16). This combination of very light eyes with brown hair is typical of Palaeolithic survivors in northern Europe, rather than of Nordics.

The Fehmarners, although quite variable individually, cannot readily be divided into distinct sub-types, since the prevailing Borreby strain has permeated the small, endogamous population thoroughly. Correlations indicate the presence in small numbers of a more brachycephalic element characterized by darker eyes than the total group, and by a convex nasal profile; this may be a Bell Beaker Dinaric survival, but if so it is almost completely absorbed. There seems to be little evidence of a classical Nordic type in this large-headed, coarse-featured group; what Nordic blood has entered into the blend has been recombined or bred out.

The other northwest German groups which have been intensively studied include the Low Saxon farmers living between the mouths of the Weser and the Elbe, the southern Dithmars population which occupies the North Sea coast between the Elbe mouth and North Frisia, the inhabitants of Finkerwarden Island in the Elbe, and the population of the Schwansen district and of the neighborhood of the Schlei, the inlet connecting the city of Schleswig with the Baltic. These four groups are very much alike; they all resemble the Frisians, as described in the last section; they are, however, less dolichocephalic, and fall in general between the Frisians on the one hand and the Fehmarn islanders on the other. They are lighter-haired than the latter, and somewhat smaller in facial breadths. In bodily build they run to less extreme constitutional types, being less frequently thick-set than the Fehmarners. As among the Fehmarners, however, there is a tendency for a shorter-statured, rounder-headed, smaller-headed, darker-pigmented, more frequently concave-nosed and more leptorrhine element to segregate itself. This type, which is Dinaric, may in part have been introduced by general population movements in modern times from South to North Germany. In Schleswig, the farmers tend to a

longer-legged, longer-headed type than the fishermen on the Baltic coast who resemble more closely the Fehmarners.

Northwestern Germany, therefore, from the Dutch border to Denmark and the Baltic, is the home of a medley of racial types in which the Brünn and Borreby races seem most prominent, with the latter concentrated in the island of Fehmarn and among the fishermen of the Baltic shore of Schleswig. The Nordic race was once important here, as was its component the Corded, but both have been largely absorbed into the earlier types, which never yielded ground strongly, even in the time of the early Germanic efflorescence.

Before turning to South Germany, let us examine two rural populations from central Germany, one from the Vogelberg in Upper Hesse,[50] the other from a group of villages inhabited by the so-called Keuperfranken, in Middle Franconia,[51] who derive their name from the red marl of the district in which they live, just southwest of Nürenberg.

The Vogelbergers are tall men, with a mean stature of 169 cm. and at the same time brachycephalic, with a mean cephalic index of 82.8. Their district lies off the edge of the relatively long-headed section of Hesse. In general metrical character, they are intermediate between the northwestern Germans already studied and the people of the southern mountain country.

Their heads are both long and broad, their vault heights great, and the facial breadths are as great as in most of the North German series with the exception of Fehmarn. In their pigment character they are likewise intermediate. The hair color is for the most part light brown to medium brown, with a high incidence (4 per cent) of red; the beards are said to be very frequently rufous. The eyes are for the most part light-mixed, with 10 per cent of pure browns. The skin is freckled in 15 per cent of all men examined, and among 66 per cent of children; heavy freckling is an infantile character which decreases regularly with age. Here freckles are linked with red hair, and are more often associated with blond hair than with brown. Sixty per cent of the Vogelberg seems to possess blond or light-mixed complexion, while only 9 per cent can be called completely brunet.

These Vogelbergers belong to a number of different types common elsewhere in Germany. Some of them are apparently standard Nordics, but the heavier, coarser featured types of North Germany are commoner, and there is a strong minority of South German-looking Dinarics. Eighteen per cent of straight occiputs indicates the presence of this group clearly.

Members of the second central German group, the Keuperfranken of middle Franconia, are shorter, with a mean stature of 166 cm. Their

[50] Richter, B., *Burkhards und Kaulstoss.* [51] Saller, K., *Die Keuperfranken.*

heads are smaller, and their cephalic index higher (mean C. I. = 84.8). Their faces are shorter and narrower; whereas the bizygomatic mean of the Vogelbergers is 143 mm., a dimension suggestive of northern Germany, that of the Keuperfranken is 140 mm., more nearly an Alpine or Dinaric dimension. The pigmentation is darker here than in the Vogelberg region, with nearly 20 per cent of brown eyes, and a great majority of dark brown and brown head hair.

Middle Franconia lies definitely south of the Borreby-Brünn racial frontier; its inhabitants belong mostly to the Alpine and Dinaric races, with many intermediate forms. The Noric type, a blond brachycephal with incipiently Dinaric facial features, seems to be relatively common, and is probably a Nordic brachycephalized through Alpine and Dinaric mixture. A few individuals, not numerous enough to influence the mean of the group statistically, seem to have retained a completely Nordic appearance. These are commoner among the Protestants than the Catholics of the district; the Protestants are taller, longer-headed, narrower-nosed, more frequently convex-nosed, lighter-eyed, and blonder-haired; they are newer in the region than the Catholics, and have not yet been completely modified or absorbed.

The population of the Alpine borderlands of southern Germany may be studied by reference to three special examples; the farmers from Reichenau Island in Lake Constance, and the nearby mainland villages of Wollmattigen and Dettingen; [52] the villagers of Genkingen in the Swabian Alps; [53] and Bavarians from Miesbach, some twenty miles south of Munich in Upper Bavaria. [54]

The first two of these groups are descendants of the Alemanni and preserve evidence of this ancestry in their dialects and culture. The Lake Constance farmers, representing the westernmost of the South German mountain peoples, have a mean stature of 169 cm., placing them in the same height category as the Vogelbergers, but are somewhat shorter than most of the North Germans. Their heads are moderately long, with a mean length of 189 mm., and a cephalic index of 82, which, while brachycephalic, is low for southern Germany. These people are for the most part dark brown or brown-haired, with a very small minority of hair blondism. Their eye color is predominantly mixed, and pure dark eyes are found in 18 per cent of the group. They are long-faced, with a mean facial index of 91, and the very leptorrhine mean nasal index of 59. They seem to be largely Dinaric, with a minor element of Alpine and a few big, thick-set Borreby-like individuals. The latter may well be remnants of the old pre-

[52] Scheidt, W., *Alemanische Bauern.*
[53] Breig, A., *Eine anthropologische Untersuchung einer schwäbische Alb.*
[54] Ried, H. A., *Miesbacher Bevölkerung.*

Bronze Age populations, or remnants of the North German invasion, more permanent than the accompanying Nordic element.

While the group just mentioned lives in the Rhine Valley, on a high-road of migration, the Swabians of Genkingen live in an isolated mountain environment. They are almost exclusively Dinaric and Noric, especially the former; there are few individuals who are typically Alpine, and only two men out of 208 investigated were dolichocephalic. Seventy per cent have convex nasal profiles, 48 per cent have steep, flattened or uncurved occiputs. Since the planoccipitals comprise nearly half the group, the Dinaric character of this population is manifest. The more typical Dinarics have pronounced naso-labial folds, heavily built chins, high orbits as shown by a great palpebral opening, and, of course, the expected nasal character. Their stature is above that for the mean of the group, and their body build lean and spare. The relative span of the whole group is 107, the relative sitting height 51.8. The blonder Noric sub-group is not as tall as the more brunet Dinarics proper, and does not show an equal accentuation of nasality and of the accompanying facial features. About 36 per cent of the Genkingen people is estimated to belong to this Noric class, which is rounder-headed (C. I. = 84.5) than the total population (C. I. = 83.0). Typical Alpines, of intermediate pigmentation, are in the minority, as they are in all Dinaric populations—no Dinaric or Armenoid group has ever been found without them.

Genkingen was settled by the Alemanni, but before that it was already occupied by a settled population; the Alemanni gave it its name and Germanic character. The Alemanni were Germanic Nordics, as skeletal remains from local graves amply testify. When standard additions to the cranial means are made to allow for soft parts, the restored Alemanni are some 7 mm. longer-headed, 9 mm. narrower-headed, 5 mm. narrower in minimum frontal breath, and 5 mm. narrower-faced than the present Genkingen people. Genkingen is a typical Alemanni street village, with all the houses built along one main thoroughfare; the house type is purely Alemannic, the dialect, the customs, and local cultural peculiarities are typically Alemannic. The Alemanni were established there in the fifth and sixth centuries, and never moved out; no one else has ever moved in, in the sense of an invasion or migration. Yet the means of the Alemanni head and face dimensions barely fall within the ranges of the living population.

The answer to this apparent enigma lies in three facts, the failure of the Alemanni to exterminate the earlier population, which was presumably of a Keltic Iron Age type, the gradual penetration of new family lines from over the mountains, and the transformation by mixture of Nordics into Norics. At present there are 24 family names in the village; of them, 3

first appeared in the sixteenth century, 8 in the seventeenth, 5 in the eighteenth, 7 in the nineteenth, and 1 in the twentieth. Although some of the names may have been brought from neighboring villages, it is said that most of them came from the south. Since only one-eighth of patrilineal lines present in Genkingen were there before 1600, and since the newcomers were mostly from an Alpine and Dinaric racial center, the problem of the change in head form in southern Germany ceases to be perplexing, especially when one remembers that Genkingen is one of the most conservative, most stable villages of southern Germany. The Nordic element has been partly bred out, partly absorbed, and in absorption it has taken the Noric form, which is actually an element of importance in the population.

The third group, that of the Upper Bavarian Miesbachers, is descended not from Alemanni, but from Bajuvars. Its history is presumably similar to that of other South German villages. The modern inhabitants are tall, with a mean stature of 170 cm., very brachycephalic, with a mean cephalic index of 85, and of medium head size. Their faces are broader and shorter than those of the modern Alemanni, and their noses less leptorrhine. Dark brown hair is predominant, blond hair is in the small minority, and the eye color is brown in 30 per cent of the group, while the skin color is a brunet-white in over 50 per cent. These people form one of the most brunet populations in Germany.

These Bavarians are mostly Alpines and Dinarics, with a little Nordic admixture; individually, a number of Atlanto-Mediterranean dolichocephals or mesocephals may be observed. On the whole, the Bavarians are more Alpine, both metrically and morphologically, than most of the population of the eastern Alps; they resemble, in their facial characters, some of the French Alpines more closely than they do the Swiss or Austrians. Southern Bavaria must be considered a minor nucleus of the Alpine race in central Europe.

In Saxony, Thuringia, and throughout eastern Germany, the racial situation is somewhat different. As an example of a relatively conservative Saxon population, we may study the inhabitants of Questenberg, a village located in an isolated valley of the southern Harz Mountains of Saxony.[55] The Questenbergers have a mean cephalic index of 82.4, which is low for eastern Germany, and the head size is intermediate between that of the South Germans and of those in the northwest. Compared to the southern Germans, these Saxons are very light in skin, hair, and eye color; the predominant hair color is a medium brown while the eyes are mostly pure light or light-mixed, and dark eyes are limited to about 5 per cent. The noses of the Questenbergers are as a rule high and narrow, and frequently

[55] Grau, R., *Die Questenberger.*

convex. These Saxons fall as a group into the Noric racial type; brunet Dinarics are rather uncommon here, as are morphologically typical Alpines. It seems most reasonable to regard these people as the descendants of Iron Age Nordics who have been partially brachycephalized by Alpine and Dinaric admixture.

Turning farther east to Silesia, we encounter a comparatively new German population. Silesia, overrun by the Slavs, was resettled by German colonists in the thirteenth century, and the colonists were mostly Thuringians and Upper Saxons, with a few from the Upper Rhine country.[56] They came from a region which is today largely Noric, Dinaric, and Alpine, but which at the time of their exodus was still considerably Nordic.

A sample drawn from Friedersdorf in the Sudeten lands of German Silesia may be taken as typical of this eastern German population.[57] The stature is only moderate, with a mean of 166 cm.; the head is of Alpine or Dinaric size and definitely smaller than those of North or West Germans, while the cephalic index of 86.5 is hyperbrachycephalic. The facial and upper facial indices are too low for Dinarics, and fall into an Alpine category; the noses, like those of the Bavarians, are usually straight in profile, and only moderately leptorrhine (N. I. = 67). Like the Saxons, these people are not infrequently blond. Medium brown hair is the commonest color; 20 per cent of eyes are brown, while most of the others are light and light-mixed.

The racial diagnosis of these people shows them to be largely Alpine in type, with a number of brachycephalized Nordics, a few Dinarics, and an important minority of snub-nosed eastern European-looking brachycephals. The presence of these last indicates that in Silesia we have already entered the eastern European racial area.[58]

Northeastern Germany, from Mecklenburg over to East Prussia, is a region of great blondism, in which northwestern German types, especially the Borreby, gradually merge into the racial forms found in Lithuania and White Russia. Von Hindenburg, an East Prussian par excellence, was an ideal example of a Borreby-East Baltic combination typical of his own class and country.

To summarize the data on the physical anthropology of Germany it seems necessary to stress the relative absence of conventional Nordics comparable to those found in eastern Norway, in Sweden, and in England. Such Nordics may be seen almost everywhere in Germany as individuals, but nowhere as a large element in the population. The Northwest Ger-

[56] Klenke, W., **ZFRK**, vol. 3, 1936, pp. 56–68.
[57] Göllner, H., *Volks- und Rassenkunde der Bevölkerung von Friedersdorf.*
[58] See Klenke, **ZFRK**, 1936.

mans represent for the most part a reëmergence of Brünn and Borreby types which have absorbed the Iron Age Nordic group almost completely, as well as the old North German Corded concentration. The southwestern Germans are the most nearly Nordic of all, but have strong Brünn and Borreby accretions. The southern Germans, from southern Baden to eastern Bavaria, are basically Alpine, with strong, often predominant, Dinaric tendencies, and a large purely brunet minority. In central Germany an intermediate condition between the North German and the South German extremes is found. In southeastern Germany, from Saxony to Silesia, while the head form is extremely brachycephalic, the pigmentation is usually light, and the head size small in comparison with the northern and western parts of the country. The racial type which is most characteristic here is the Noric, a blond Dinaric form resulting from a brachycephalization of Iron Age Nordics through direct or indirect Alpine admixture. In Silesia, to the same elements may be added a broad-faced, snub-nosed, brachycephalic strain which we have already observed among Finns and Balts, and which will be studied in further detail in Poland and Russia. The northeastern Germans are for the most part blond brachycephals, varying in type from Borreby to East Baltic, and especially the latter.

Germany, by and large, is a country in which a variety of pre-Mediterranean racial types have experienced a maximum reëmergence, and in which Mediterranean and Nordic elements have experienced a differential alteration in response to Alpine mixture. In its blended Noric form, the Nordic has survived in greater numbers than the low percentage of the unmixed form would indicate.

(6) SWITZERLAND AND AUSTRIA

To the south of the South German ethnic region lie Switzerland and Austria; the former contiguous to Baden and the latter to Bavaria. Northern and central Switzerland form an extension of the Alemannic settlement area already studied in Baden and the Swabian Alps, while western Switzerland is old Burgundian territory. The southeastern cantons lie on the periphery of the Germanic advance, and contain linguistic and cultural vestiges of the old Romanized Rhaetians.

In a geographical sense, Switzerland is almost entirely composed of three great valleys, forming the head waters of the Rhine, of its tributary the Aar, and of the Rhône. Each of these rivers includes a large lake in part of its course; the Rhône has Lake Geneva, the Aar Lake Neuchatel, and the Rhine Lake Constance. The main chain of the Alps lies on the southern Swiss border; thus most of the country is open only to the northward and westward. However, part of the Grisons empties into the Danube,

and the canton of Ticino lies in the drainage of the Po. The waters of Switzerland, therefore, empty into the North Sea, the western Mediterranean, the Adriatic, and the Black Sea; Switzerland truly forms the nucleus of the continent of Europe.

Four languages are spoken in present-day Switzerland, of which three—French, German, and Italian, have long been official. The fourth, a provincial Latin derivative, spoken by the descendants of the Romanized Rhaetians, includes the dialects of Ladin and Romansch, and has only recently acquired its legal status.[59] Other groups speaking this language live in the Tyrol and in northeastern Italy. Of the four million Swiss, 71 per cent speak German, 21 per cent French, 6 per cent Italian, and slightly more than 1 per cent speak Ladin and Romansch. French predominates in the west, in the cantons of Vaud, Neuchâtel, Geneva, Freiburg, and Valais; Italian in Ticino; and German elsewhere. Ladin is spoken in the Engadine, and Romansch in the Bünder Oberland, both in the canton of Grisons.

The country is likewise divided on a religious as well as linguistic basis, with 58 per cent of Protestants, and the rest mostly Catholic. Protestants are most numerous in the north and west, Catholics in the south and center. In general, the French-speaking territory is prevailingly Protestant, the Italian-speaking territory Catholic, while both persuasions are evenly partitional among the German speakers. There is no clear correlation between language and religion. Divided by language and by religious belief, the Swiss likewise preserve strongly differentiated local cultural traits, which vary greatly from canton to canton. Despite these differences, Switzerland, owing to geographical and historical causes, remains a very closely integrated nation. As Montandon has remarked, its very diversity in these respects has without doubt done much to inculcate in the Swiss their neutral and international character.[60]

The present-day Swiss are also divided to a certain extent in a racial sense. Those living in the northern and western valleys resemble the populations found in southwestern Germany, where a combination of moderately tall stature, low brachycephaly, and moderately light pigmentation indicate a Nordic survival of racial elements in Alpine-Dinaric racial territory. The southern and eastern Swiss, on the other hand, are darker and rounder-headed and show less of this northern lowland influence.[61]

[59] In June, 1938. See Lansel, Peider, *The Raeto-Romans*.

[60] Montandon, G., *L'Ethnie Française*, pp. 182–195. This contains an excellent summary of the physical anthropology of the living Swiss.

[61] An extensive survey of Swiss recruits carried on between 1927 and 1932 under the direction of Dr. Otto Schlaginhaufen has at the time of writing received only preliminary publication. The survey covers 35,000 recruits from all parts of Switzerland, and

The mean stature of 35,000 recent Swiss recruits is 168.6 cm., a figure comparable to that of southern and western Germans. It has risen greatly in recent years, since the mean for the 1884–91 period was 163.5 cm. There are three areas in which tall stature is commonest; the country around Geneva and Lake Neuchâtel, and western Valais; the very north, from Basel to Lake Constance; and the eastern Grisons. Elsewhere local variability is great; the shortest stature occurs in parts of Bern, and in Appenzell-Innerrhoden in the northwest. In the 1880's the stature in the two Appenzells was at the 160 cm. level; by 1930 it had risen to 165 cm. in Appenzell-Innerrhoden and to 166 cm. in Appenzell-Ausserrhoden. Areas of depression, *taches noires* in the French sense, seem to have been ironed out; low stature in Switzerland is directly environmental and not racial.

In the 1927–32 survey the mean cephalic index of 81.3 was found for all of Switzerland. This low figure comes as a surprise to the majority of anthropologists, who have long considered Switzerland to be the center and homeland of the Alpine race in Europe. The Alpine race, however, is much more concentrated today in France, in northern Italy, in Bavaria, and in southern Albania than it is in Switzerland. The cantons range from 79.6 in Basel city to 83.7 in Ticino; in general a line drawn from the western end of Lake Constance to the eastern end of Lake Geneva will divide the mesocephals and near-mesocephals of the northwest from the sub-brachycephals and brachycephals of the southeast.

One reason why the discovery that the Swiss as a nation are only sub-brachycephalic is so surprising is that most of the published cranial series have mean cranial indices varying from 82 to 87. With few exceptions these are drawn, however, from the southern and eastern cantons, from small local populations in the roundest-headed part of Switzerland. Still, Pittard's total mean for several hundred crania from Valais is 84.5, as contrasted with a cephalic index of 82.2 on the living. This discrepancy may be partly technical and partly due to regional selection,[62] but one is tempted to believe that the great increase in stature in recent times has been accompanied by a lowering of the cephalic index.

The mean cranial and facial diameters of the living Swiss strongly suggest that the non-Alpine, non-Dinaric elements in the population are Nordic and Mediterranean, especially the former, and not Brünn or Borreby, as in northern and much of western Germany. The mean head

includes detailed measurements and observations. Its final publication should supplant all previous studies of a general nature. Preliminary notices which present summaries and portions of these data include: Schlaginhaufen, O., **BSGA**, vol. 13, 1936–37, pp. 7–11; **BIKB**, 1936, pp. 507–511.

[62] As one moves up the Rhône Valley within the canton of Valais, the mean C. I. on the living increases, from 80 at Sion to 83 higher up. Bedot, M., **BSAP**, ser. 4, vol. 6, 1895, pp. 486–494; ser. 4, vol. 9, 1898, pp. 222–236.

length for Swiss males is 189 mm., the breadth 154 mm.; the total face height is 122 mm., the bizygomatic 137 mm. The facial index mean is 89, that of the nasal index 63.[63] Fifty-eight per cent have straight or wavy nasal profiles, 16 per cent concave, and only 25 per cent convex. Thus the Alpine and Nordic nasal forms outweigh the Dinaric.

The Swiss are on the whole as blond as most West and South Germans, and less so than North Germans. About 50 per cent of recruits have dark brown hair (Fischer #4–5) while the rest have for the most part medium to light brown shades. Brown and dark-mixed eyes are found in one-third of the group.[64] On the whole central and northern Switzerland are the blondest, and in these regions small localities may be extremely blond; light pigmentation is geographically associated with German speech. Italian and Romansch-speaking centers are the most brunet, while the French-speaking cantons are intermediate. In the northern cantons ash-blond hair (Fischer #22–26) is common, and is largely identified with Noric and sub-Nordic types.[65]

The principal results of this survey of Switzerland are: the discovery that the Alpine-Dinaric racial complex is centered to the south and to either side of the Republic; the determination that a large Nordic element has survived here in solution, only partly brachycephalized by Alpine and Dinaric mixture; the further determination that Switzerland has been entirely or almost entirely free from Brünn-Borreby intrusion.

Austria, which lies to the east of Switzerland, and which is now politically a part of Germany, is almost wholly contained within the drainage of the upper Danube. Vorarlberg, however, forms part of the uppermost segment of the Rhine basin, while the southern Tyrol, at present under Italian sovereignty, lies over the Alpine watershed in the drainage of the Adige. Austria in the political sense is entirely Germanic in language, except for the presence of a few Slovenes in the Bürgenland; in the Italian Tyrol there are German, Italian, and Ladin-speaking communities. Like Switzerland, Austria faces northward, with the Alpine watershed at her back; this northward exposure is largely responsible for the retention of Austria's Germanic character from the days of the Völkerwanderung. While Switzerland's face is turned more specifically to the northwest than to the true north, Austria's orientation is rather to the northeast; thus in a sense the two upland areas, with the Rhine-Danube watershed between

[63] Regional data will be found in:
Schwerz, F., **NDSN**, vol. 45, sec. 2, 1910.
Zbinden, F., **AFA**, vol. 38, 1911, pp. 280–317.

[64] Schlaginhaufen, O., **BSGA**, vol. 3, 1926–27, pp. 21–36.

[65] Zbinden, F., **AFA**, vol. 38, 1911, pp. 280–317. I am using "sub-Nordic" here in Montandon's sense, to designate a Nordic partially brachycephalized by Alpine admixture.

them, are isolated from each other. While the first Neolithic civilization of Switzerland came up the Rhône from the western Mediterranean and Spain, that of Austria was derived from the east by way of the Danube. These differences have been obscured by some subsequent events, and strengthened by others; still the ultimate distinction remains.

The present Austria consists of seven provinces; Vorarlberg, Tyrol, Salzburg, Carinthia, Styria, Upper Austria, and Lower Austria; to these will be added for present purposes the Trentino, or Italian Tyrol. All of these regions have been subjected to anthropometric study, and the racial situation in Austria may be stated without ambiguity.

Lower and Upper Austria, which are both situated directly in the Danube Valley, and both of which include the southern foothills behind the alluvial plain, stand on a highroad of migration and occupy one of the most fertile and desirable areas of Europe. They lie within the probable area of development of one branch, at least, of the Nordic race; Danubians, Corded people, Bell Beaker folk, all contributed to the racial amalgam of the ages of Bronze and Iron; the Germanic and Slavic invasions of the present era have furnished additional increments. Slavic influence has been greater in Lower than in Upper Austria, but secondary to the Germanic in both.

The population of the two Austrias belongs, with that of Switzerland, in an Alpine-Dinaric-Nordic category.[66] The mean cephalic indices of the various districts range from 80.8 in Hernals, just west of Vienna, to 84.8 in Waidhofen, also in Lower Austria. In general, the districts lying north of the Danube in both provinces have higher means than those on the southern bank; they approach the higher brachycephaly of Bavaria and of Bohemia. Lower and Upper Austria form a relatively long-headed interlude between the brachycephalic nucleus just mentioned and that of the Tyrol.

The stature of these two provinces, Lower and Upper Austria, ranges about the mean of 167–168 cm., with little regional variation. Brown hair occurs in over 40 per cent of the group, and one-third have been classed as blond. Eyes are for the most part blue or gray with accompanying mixtures, and browns account for some 24 per cent of the total. Fair or light-mixed complexion types are commoner than brunet ones. The ash-blond hair with gray or mixed eyes combination is frequent, and is associated not only with a few phenotypically pure Nordics, but also with the much commoner Noric form. The Dinaric type emerges, in sorting, as the tallest but not the most brachycephalic element. Of the four most easily recognizable types in these provinces, Noric, Alpine, Dinaric, and

[66] Brezina, E., and Wastl, J., **MAGW**, vol. 59, 1929, pp. 19–38, 311–322.
Weisbach, A., **MMSC**, vol. 11, 1892; **MAGW**, vol. 24, 1894, pp. 232–246.

Nordic, the first is probably the commonest. Thus altered and unaltered Nordics must account for well over half the population. The Nordic element must be derived as much from a local Hallstatt as from a Germanic source.

In the three provinces of Salzburg, Carinthia, and Styria, the racial situation is much the same as in Lower and Upper Austria.[67] In Salzburg there are fewer brown eyes (20 per cent) and the Noric element appears particularly important; unaltered Nordics are common only in Lower Austria. In South Styria and in Carinthia the stature approaches the 170 cm. level, blondism slightly decreases, and a Dinaric type becomes commoner.

On account of its reputation as a Dinaric racial center, the Tyrol has been the subject of many special investigations.[68] The Tyrol in the geographical and ethnic sense includes the upper valley of the Inn, which served historically as a highroad of Germanic invasion over the Alps, and the smaller mountain valleys on either side of the Alpine chain. A branch of the Inn, the river Wipp, leads directly to the Brenner Pass and down into Italy. The Tyrol was not settled until the Metal Age; the first inhabitants who came in any numbers were Atlanto-Mediterraneans from northern Italy, and Dinarics both from southern Germany and from Italy. In Hallstatt times, however, the population increased, and the Rhaetians, later to become Romanized, developed as an ethnic unit under Hallstatt cultural tutelage. The Ladin speakers of the side valleys of the Italian Tyrol are today in most respects good representatives of the pre-Roman Rhaetians, while the Germanicizing and Italicizing of the others has been only partial in all respects other than in language. The Dinaric racial type has had, in the Tyrol, a complete continuity from the Bronze Age to the present.

The living Tyrolese are moderately but not extremely tall; valley means range from 167 cm. to 172 cm. They are brachycephalic, with means varying between 82 and 87. On the whole the Italian speakers are the least brachycephalic, and the Ladin speakers and some of the German

[67] Keiter, F., **MAGW**, vol. 43, 1933, pp. 293–319.
Ploy, H., **MAGW**, vol. 38, 1908, pp. 324–347.
Weisbach, A., **MAGW**, vol. 25, 1895, pp. 69–84; vol. 28, 1898, pp. 195–213; vol. 30, 1900, pp. 79–99.

[68] Principal works on the living includes:
Knöbl, G., **MAGW**, vol. 43, 1933, pp. 320–325.
Lebzelter, V., **MAGW**, vol. 59, 1929, pp. 209–228.
Tappeiner, F., *Studien zur Anthropologie Tirols*, Innsbruck, 1883; **ZFE**, vol. 12, 1880, pp. 269–288.
Toldt, C., **MAGW**, vol. 21, 1891, pp. 69–78, also Supplement.
Much more has been done on the craniology of the Tyrolese than on the living population.

speakers the most so, while the greatest brachycephaly lies on the Italian side of the divide. The Tyrolese are typically intermediate in pigmentation; brown hair is commonest, although on the German side a large minority is blond; among Italian speakers black hair rises to over 20 per cent. Among German speakers brown eyes run to roughly 20 to 30 per cent; among Italian speakers they approach 40 per cent. The Ladiner, who are among the roundest-headed, are definitely the darkest; with over 45 per cent of dark eyes, and over 75 per cent of black and brown hair. There is, in all the Tyrol, a strong minority of brunet or swarthy skin color, which rises to 50 per cent among the Ladiner.

The cranial and facial dimensions of the Tyrolese[69] resemble those of the Swiss, except that the vault lengths are shorter and the facial breadths greater. The head length mean for brachycephals with a mean cephalic index of 85.8, is 185 mm., the breadth 159 mm.; the minimum frontal, bizygomatic, and bigonial diameters are 109 mm., 142 mm., and 109 mm.; the face height is 126 mm., and the nasal dimensions are 58 mm. by 36 mm.; the facial index 87, the nasal index 63. The only real differences between the Tyrolese and the rest of the Austrians lie in a shorter head length mean and a broader jaw.

Toldt,[70] in a study of 710 modern Tyrolese crania, of which 83 per cent are brachycephalic, finds 47.5 per cent of the whole, or over half of the brachycephalic specimens, to be planoccipital; the ratio for the different valleys inhabited by German and Italian speakers varies from 23 per cent to 54 per cent, but it rises to 70 per cent in the crania from the Ladin-speaking districts.

Planoccipital Tyrolese crania differ from their curvoccipital neighbors in but a few measurements, although the morphological differences are greater. In the planoccipital crania, the distance from glabella to inion is nearly as great as the maximum length; in curvoccipital skulls the difference between these two diameters is considerable. In the planoccipital crania, the mean post-auricular length is 75.9 mm.; the mean for the curvoccipital crania is 82.4 mm. An index between the nasion-basion length and the post-basion base length of the skull is approximately 60 to 70 in the planoccipital, and 88 to 100 in the curvoccipital, crania. Thus the differences between Alpine and Dinaric skulls lies not so much in total vault diameters or in facial dimensions as in the measurements which indicate that the ear hole and foramen magnum lie to the rear in the planoccipital crania, and that, owing to the steepness of the occipital bone, lambda stands relatively forward. The metrical peculiarities of the Dinarics are more easily determined on the crania than on the living.

[69] Frizzi, E., **MAGW**, vol. 39, 1909, pp. 1–65.
[70] Toldt, C., **MAGW**, vol. 40, 1910, pp. 67–100.

Before leaving Austria we may mention the racial position of the inhabitants of the Walserthal in Vorarlberg, a high valley draining into the Rhine.[71] The Walserthal is the scene of a Germanic thrust directly from the north, of the same nature as those which affected Switzerland; the living Walser, who are blonder than the Tyrolese, are metrically comparable to the populations already studied in Baden and the Swabian Alps, rather than to the Alpo-Dinaric group in its purer form.

(7) ITALY

Italy, one of the most clearly demarcated geographical units in Europe, is a country of considerable racial variability. Although the Mediterranean race is strongly represented in it, Italy belongs only partially to the Mediterranean world, for much of it is more typically Alpine racial territory. Unfortunately, it is impossible to trace the early prehistory of the Alpines in Italy, since our knowledge of the Palaeolithic and Mesolithic periods there is still obscure. The primary racial impulse of the early Neolithic, however, is known. This was the immigration of small Mediterraneans in great numbers, coming largely if not entirely by sea; these first food-producers were followed by more competent navigators, Atlanto-Mediterraneans, who settled chiefly in the north and in the islands, and Dinarics from the eastern Mediterranean in search of metal. Some of these Dinarics penetrated the Alpine Valleys while others settled in the Po Valley and in central Italy. The movement of highly cultured peoples from the east into Italy continued into historic times, and included the settlement of the Etruscans in Tuscany, and of the Greeks in Sicily and in the southern end of the peninsula.

As early as the Bronze Age there were, however, counter-movements from the north, including the invasions of the early Italici, ancestors of Oscans and Umbrians, Latins and Faliscans, and also the arrival of Illyrian tribes in northern and eastern Italy. Whereas the movements by sea had brought in Mediterraneans of different kinds, some short and some tall, some straight-nosed and others beaked in a Near Eastern manner, as well as Dinarics, the movements from the north introduced Nordics of two varieties; the classic Hallstatt type, and the Keltic Iron Age type which was later to form the basic racial element among the Roman patricians. Further invasions from the north, of Kelts and of Germans, had only local influence.

More important perhaps than many of these invasions was the effect of the Roman industrial system, which relied on involuntary labor, and which necessitated the introduction of slaves of all known races and

[71] Wacker, R., **ZFE**, vol. 44, 1912, pp. 437–524.
Weidenreich, F., **BSGA**, vol. 4, 1927–28, pp. 5–6.

countries by the thousands. Although some of these slaves were prevented by ill usage and by segregation from propagating, the majority without doubt reproduced, and with their emancipation under Christianity blended readily into the local populations. Other strangers who were not slaves moved to Italy in great numbers; as traders, craftsmen, soldiers, and visitors attracted to the center of civilization. Thus through her rôle as mistress of the world Rome accumulated and assimilated a heterogeneous population.

That this population was by no means purely or even predominantly Mediterranean is shown by the study of the skulls of Pompeiians,[72] victims of the eruption which turned their city from a metropolis into a museum. These crania, with a mean cranial index of 80, represent a population which had acquired a racial character of its own despite its mixed origin, and in which the Alpine element was the most important. The vaults are of moderate size, as are the faces; the mean nasion-menton height of 119 mm. is too low to suggest a strong Dinaric element, which the mesorrhiny typical of the group also precludes. A series of 100 modern crania from Bologna,[73] with a mean cranial index of 83.5, is almost purely Alpo-Dinaric, with the latter element in a position of prominence. The Dinaric race is common in northern, but not in southern Italy, and this distinction has been true since the Bronze Age.

Our knowledge of the physical anthropology of living Italians is based largely upon the work of Livi,[74] who measured some 300,000 recruits of the classes of 1859–63. In using this material it must be remembered that it is over half a century old, and that Livi's head measuring technique was not in accordance with modern standards. Thus the Italians are without doubt taller now than in Livi's day, and they are from one to two points less brachycephalic. Despite these corrections, Livi's work is of great value. It has established the main facts of regional distribution in Italy beyond question. These are that stature increases as one goes northward from Sicily and the toe of Italy; that the cephalic index increases in the same manner, as does blondism. In northern Italy the tallest men are longer headed than the mean; in southern Italy the shortest men are longer headed. Blondism is everywhere correlated with a relatively high cephalic index.

In other words, the southern Italians are a blend for the most part of Alpines and small Mediterraneans, while among the northern Italians the nost important dolichocephalic strain is the Atlanto-Mediterranean. The

[72] Nicolucci, G., **APA**, vol. 12, 1882, pp. 143–178.
Schmidt, E., **AFA**, vol. 17, 1888, pp. 189–227.
[73] Calori, C. L., **MASB**, ser. 2, vol. 8, 1868, pp. 205–234.
Schwerz, F., **AFA**, vol. 43, 1917, pp. 181–195.
[74] Livi, R., *Antropometria Militare.*

association of relatively great blondism with brachycephaly merely indicates that both Alpines and Dinarics are characteristically mixed or intermediate in pigmentation. The few unaltered Nordics still found in northern Italy and in aristocratic families elsewhere are far outnumbered by Atlanto-Mediterraneans.

The mean stature for the recruits of 1859–63 was 164.5 cm., that for the classes of 1907–09 was 165.5 cm.[75] A better figure for the present would probably be 166 cm. The present provincial range would probably run from 164 cm. in the south, to 168 cm. in Piedmont and Veneto, as well as in the Trentino. The mean cephalic index of Livi's recruits was 82.7; that of the 1907–09 class 80.8. The reduction of two index points is largely technical, but may be partly due to stature increase. Despite this difference, the northern Italians, the Piedmontese particularly, are very brachycephalic, more so than the Swiss or Austrians, and the Piedmont forms a continuation of the southwestern French zone of Alpine racial concentration.

Special studies of southern Italians and Sicilians have been made in America, where several millions of these people live.[76] Although some selection may have taken place in the determination of who should come to America and who should stay at home, they probably fall near enough to the total mean for present purposes. This group is not short, but slightly under medium in stature; the present mean is about 165 cm. A relative span of 102, and a relative sitting height of 53.3, strongly indicate a short-legged, short-armed, and long-bodied condition, while a mean weight of 150 pounds is heavy for this stature level. Although slender, delicately built Mediterraneans are found among these people, the great majority are thick-set, short-necked, short-fingered, broad-handed, and heavy-torsoed. They incline to corpulence in middle age, and few of the women remain slender past the period of child-bearing.

The mean cephalic index for this group is 79; there is, however, a great range, and many are typical brachycephals. The head size stands in accord with the body bulk; a mean head length of 191 mm., and breadth of 151 mm., indicate a larger vault than is usual among Mediterraneans of the same stature. The facial breadths again exceed Mediterranean figures; the minimum frontal mean is 106 mm., that of the bizygomatic

[75] Gini, C., **CIPP**, ser. 1, vol. 5, 1934, pp. 589–607.

Gini's figures cover exactly the same territory as Livi's, and do not include recruits from the provinces acquired by Italy since Livi's day.

[76] Boas, F., *Materials for the Study of Inheritance in Man;* **ZFE**, vol. 45, 1913, pp. 615–626.

Davenport, C. B., and Love, A. G., *Army Anthropometry.*

Hooton, E. A., *The American Criminal.*

Hrdlička, A., *The Old Americans.*

Willoughby, R. R., **HB**, vol. 5, 1933, pp. 690–705.

140 mm., and of the bigonial 108 mm. These dimensions fall suggestively into the Alpine category, while at the same time resembling those of coastal groups from Portugal. The mean total face height is 121 mm., the upper face height 70 mm. Facial and upper facial indices are mesoprosopic and mesene. The nasal dimensions (54 mm. by 36 mm.) are moderately long and broad, the nasal index mean of 67 leptorrhine, but in a Mediterranean and Alpine rather than Nordic or Dinaric sense.

The skin color is as a rule dark; over 50 per cent of unexposed shades are definitely light brown or olive-colored, while the exposed skin often tans to a distinctive reddish-brown. Ten per cent are freckled. About 30 per cent have black hair, and 48 per cent dark brown; reddish brown shades, or dark to medium brown with a reddish glint, account for some 16 per cent, while the remaining 6 per cent have light brown or blondish colors. Pure dark eyes are found among 44 per cent of those studied; mixed eyes among 50 per cent, and pure light eyes among 6 per cent. The high ratio of reddish shades in the hair and of mixed eyes reflects the strong Alpine strain in this population, as does the large minority of non-brunet skin colors and the presence of freckling. Of the mixed eyes, the majority are dark-mixed, and green-brown combinations are three times as common as blue-brown and gray-brown put together.

The southern Italians depart from a Mediterranean standard in the development of the pilous system; over 80 per cent have medium to heavy beards, and the body hair is heavier than among any other European group studied.[77] The hair is rarely fine, usually coarse to medium in texture, and is curly in 10 per cent of this group, while wavy forms are usual. The forehead is of medium height and slope, as a rule, and the browridges medium; their typical development is Alpine rather than Mediterranean. The eyebrows are usually heavy, in 57 per cent concurrent. The nasion depression is medium to deep, the nasal root of medium height, and frequently broad. The nasal bridge is usually quite high, and broader than among most other Europeans; the profile is variable, with large concave as well as convex categories; several types are present in this respect. The nasal tip is as a rule thicker than the European standard, and the wings as often flaring as compressed. In 35 per cent the tip is depressed. The lips vary considerably in thickness, but more fall into the thick category than in most European groups; well over a third show a visible degree of facial or alveolar prognathism. The chin is frequently prominent, and the gonial angles frequently flaring; prominent malars are much commoner than compressed ones.

The southern Italians, as this survey will indicate, are a distinctive

[77] That is, in Hooton's American criminal material, drawn directly from all parts of Europe.

group of people who do not fall into any one recognized racial category. Besides conventional Mediterraneans and Alpines there are two special types which are particularly common, and will be familiar to anyone living in Italian sections of the United States, as well as to anyone who has visited southern Italy. These are: (1) a coarse Mediterranean, short-statured, thick-limbed, mesocephalic, possessing a narrow forehead, wide malars, heavy browridges, a short, broad, straight or lightly concave nose with upturned tip, a strong jaw, and some prognathism; (2) a local approximation to an Armenoid, short-statured, especially thick-set and short-necked, with a flattened occiput, dome-shaped lateral vault profile, heavy browridges, a high-rooted, high-bridged, thick-tipped and depressed-tipped nose, and an especially prominent jaw.

The coarse Mediterranean mesocephal has counterparts in Spain and Portugal, as well as North Africa, and goes back at least to the time of the shell-heap burials of Muge. It seems, however, especially prevalent among South Italians. The local Armenoid may be partly descended from Near Easterners brought to central and southern Italy in imperial times, but it is more likely that it is to a greater extent a local combination of Alpine with various Mediterranean elements, through the mechanism of differential inheritance.

Observational data on the population of the neighborhood of Bologna [78] permits, by contrasts to the foregoing, a study in some detail of a North Italian population, one with a mean stature of about 168 cm. and a mean cephalic index of about 83 or 84. The skin color of the face is about equally divided between light brown and pinkish-white; the hair is black in 25 per cent, dark brown in 60 per cent, and light brown to blond in the rest of cases. Twenty-five per cent of eyes are dark brown, 38 per cent light brown or dark-mixed, and 27 per cent light-mixed or light. The pigmentation is lighter than in southern Italy, but still prevailingly brunet. There is a slight linkage between the lightest hair and eye colors and dolichocephaly, indicating that a Nordic type has preserved its identity as a minor element here.

The development of the pilous system is less marked here than in the south; body and beard hair are of normal European thickness; furthermore, only 14 per cent have concurrent eyebrows. These actually go more with the dolichocephals than with the brachycephals. The noses are convex in 32 per cent, straight in 58 per cent, and concave in 8 per cent of the group; convex noses are slightly more frequent among the long heads. Nasal tip thickness is usually medium, and lips are frequently thin. The thin nose and thin lip combination, which takes the form of a positive correlation, is again linked with dolichocephaly.

[78] Frasetto, F., *Note Antropologiche Sulla Popolazione del Bolognese.*

In the population of the Bolognese there is a strong prevalence of Alpine and Dinaric types, especially the former, but approximately one-third of the population is long-headed or nearly so. Among this third, Nordics are not uncommon, but the most important element is a tall, slender, brunet, long-faced type, with a thin, straight or convex nose, and thin lips. It is a variant of the Atlanto-Mediterranean, with some of the Cappadocian facial features brought from western Asia by early navigators, including the Etruscans. Associated with this type is a frequent obliquity of the eye slits, which are very long; highly arched eyebrows and full malars. The beauty of Bolognese women is proverbial, and the type described above is to a certain extent responsible for this reputation. It is common elsewhere in northern Italy as well, and was often portrayed by Renaissance painters. This type is also found as a minor element in the Tyrol, where it seems to form a basic part of the Dinaric racial complex.

No country in Europe in which one language and one cultural tradition prevail shows a greater diversity of race between its southern and its northern extremities than does Italy. The binding element which is common to all sections is the Alpine, which has reëmerged from obscure beginnings through a superstructure composed of Dinaric, Nordic, and various kinds of Mediterranean accretions. Italy stands on the fence between the Alpine and Mediterranean worlds.

(8) THE LIVING SLAVS

(a) *Czechs and Wends*

Owing to the geographical distribution of living Slavic-speaking peoples, it seems advisable to divide them into four groups, to be treated separately and, as nearly as possible, seriatim. These are the central and western Slavs, including the Czechs, Slovaks, and Wends; the northern and eastern Slavs, from the Poles across Russia to Siberia; the southern Slavs, living almost entirely in Jugoslavia, and the Bulgars, who will be treated with other peoples of the Balkans. It will be recalled that the Slavs, the last of the great Indo-European-speaking peoples to expand, were, like all of the others who had preceded them, primarily Nordic in race. Like all of the others they were destined to lose in varying degrees this original racial identification.

The republic of Czechoslovakia, with its pre-Munich population of some 15,000,000 was, until the events of October, 1938, one of the most ethnically varied of the post-war nations of central and eastern Europe. Only 50 per cent of its population was Czechish, and the other half was composed as follows: Germans, 23 per cent; Slovaks, 16 per cent; Magyars, 5 per cent; Ruthenians, 4 per cent; and Jews and all others, the

remainder.[79] The Czechs themselves are confined largely to Bohemia and Moravia. They are descendants of the early Slavic immigrants who pushed aside or absorbed earlier Keltic and Germanic settlers, and who, in the shelter of their mountain-hemmed plain, have resisted the Germanic thrust to the east, which began in the twelfth century and which since has almost surrounded them. Owing to this Germanic contact and to their isolation from the rest of the Slavic world, the Czechs are culturally western European, at least in outward respects, and have developed into a highly industrialized modern nation.

The pre-Christian Slavic grave material from Bohemia is almost entirely dolichocephalic. Although the principal racial type represented is Nordic, the early Bohemians, like the rest of the Slavs, included a minority of broad-nosed, low-orbitted individuals. Some of their crania, furthermore, were unusually large and heavy.[80] Very few centuries passed, however, before the racial character of the Christianized Bohemians began to undergo a radical change.[81] Only in the sixth century A.D. was the Slavic settlement of Bohemia complete; by the ninth the mean cranial index of the Czechs had risen from 75 or 76 to 77; by the eleventh or twelfth century it had reached 78. In the early sixteenth century it had reached only 80 or 81, but after the great plague of 1520 it began to climb rapidly, so that in the seventeenth century it had risen to 83.5, and in the eighteenth to 85. This complete alteration of head form in Bohemia is one of the most marked and best-documented phenomena of its kind in the racial history of the world. Most of it happened in modern times, under the eyes of writers and historians, but it remained virtually if not entirely unnoticed until the central European craniologists, well within the last fifty years, brought it to light. As in southern Germany, the change involved not merely the shape of the cranial vault, but facial and nasal measurements as well. There can be little doubt that the same causes and the same mechanisms operated in both regions.

The living Czechs are, in a metrical sense, typically Alpine, and the Alpine race is, by the observation of individuals, seen to be the commonest

[79] Census of 1930. It is too soon after the Peace of Munich to obtain accurate figures on the population components of what remains.

[80] See Chapter VI, section 7, for an exposition of early Slavic racial history.

[81] Czekanowski, J., **AnthPr,** vol. 10, 1932, pp. 200–207.
Hellich, B., *Praehistorické lebky v Čechách ze Sbírky Musea Království Českého.*
Malý, J., **AnthPr,** vol. 3, 1925, pp. 156–176.
Matiegka, J., **MAGW,** vol. 23, 1893, pp. 93–94; *Crania Bohemica;* **AnthPr,** vol. 2, 1924, pp. 183–210; vol. 4, 1926, pp. 163–219; **RCA,** vol. 2, 5, #42, 1896; also review in **AFA,** vol. 25, 1898, pp. 150–154.
Niederle, L., **MAGW,** vol. 22, 1897, pp. 82–85.
Pexiederova, M. R., **AnthPr,** vol. 9, 1931, pp. 276–319.
Szombathy, J., **MAGW,** vol. 52, 1922, p. 20.

MAP 14

LANGUAGES OF EAST-CENTRAL EUROPE AND OF THE BALKANS

This map illustrates in a general way the distribution of linguistic groups in the most complex section of Europe in the linguistic sense. The distribution of Germans, Poles, Rumanians or Vlachs, Turks, etc. outside their national boundaries is in each case schematic; owing to the facts that villages are interspersed, and that families within villages scattered, it is impossible to make a map of this size even approximately accurate without color. An added difficulty is that the sources from which it has been compiled differ greatly, and it is impossible in many areas to obtain reliable information. For the Dobruja district of Rumania, where the racial and linguistic medley is more confusing than elsewhere, no attempt has been made at stippling. The so-called Tatar district farther north is also extremely varied and has also been left white.

single type among them.[82] They are little different in bodily build and in head and face dimensions from Bavarians. The mean stature of the Czechs is approximately 167 cm.; the mean cephalic index about 84. The commonest hair color is a medium brown, which includes some 47 per cent of the population; only 17 per cent have dark brown hair, and black hair is exceptional. Of the light brown and blond shades, the golden is commoner than the ashen. Some 38 per cent of the eyes are listed as brown, but light brown is commoner than dark brown; pure blue eyes are found among 18 per cent, and the rest are mostly light-mixed. The Czechs are as fair as most southern Germans. While Alpines and Norics are commonest in Bohemia, there is a strong concentration of Dinarics in Moravia, especially among the miners, who seem to form a special group with both racial and occupational peculiarities.

The snub-nosed, broad-faced, blond type commonly associated with Slavs is occasionally seen among Czechs, but is numerically rare. It seems to be commoner among Slovaks, although the Slovak-speaking population of Moravian Wallachia, in central Czechoslovakia, being composed of the Slavicized descendants of Rumanian Vlach colonists, is partly Dinaric.[83] As far as one can tell, the Slovaks in general seem to be shorter than the Czechs, and smaller-headed, while equally brachycephalic. Their relationship seems to lie with the eastern Slavic world rather than with Bohemia.

Before turning to Poland, let us study for a moment the Slavic island of Wends who live in the Spreewald district of Mecklenburg.[84] In the period between the eighth to twelfth centuries, at the time of the maximum Slavic expansion westward, and before the Germanic counter-thrust eastward, the Wends occupied much of present-day Mecklenburg. They were a long-headed people, with a mean cranial index of 76.6, mostly Nordic, but rather short-faced and mesorrhine. They resembled the contemporary Slavs in Bohemia, West Prussia, and Pomerania, and in subsequent centuries underwent a parallel brachycephalization. The modern Wends, inhabiting but a fraction of their former territory, have now a mean cephalic index of 84, and a stature of 167 cm. They are little

[82] Ehrich, R. B., unpublished measurements on Bohemians and Moravians.
Matiegka, J., **Cl**, vol. 1, 1891, pp. 429–437, 533–540. See **MAGW**, vol. 22, 1892, "Sitzungsberichte," pp. 18–82.
Rehak, J., **AnthPr**, vol. 1, 1923, pp. 284–297.
Schneider, L., **MAGW**, vol. 27, 1897, pp. 45–46.
Suk, V., **SPFM**, #124, 1933.
Weisbach, A., **MAGW**, Suppl. 2, 1889.
Willoughby, R. R., **HB**, vol. 5, 1933, pp. 690–705.

[83] Suk, V., and Augusta, K., **SPFM**, #175, 1933.

[84] Asmus, R., **AFA**, vol. 27, 1902, pp. 1–36.
Merkenschlager, F., *Zur Volks und Rassenkunde des Spreewaldes*. See V. Lebzelter's review in **MAGW**, vol. 44, 1934, p. 178.

different from the surrounding German-speaking population. Influences which have affected them have affected all in their neighborhood; the Wendish problem is no different from that of the rest of eastern Germany.

(9) THE LIVING SLAVS (*Continued*)

(b) *Poland and Russia*

The study of the living Slavic-speaking peoples of Poland and Russia should, at this point, be a comparatively simple matter, since we have already reviewed early Slavic history (Chapter VI, section 7), and have studied the physical anthropology of the Finno-Ugrian peoples, whom the Slavs, in their eastward expansion, have largely absorbed, as well as that of the near relatives of the Slavs, the Balts. Although Poland and Russia between them occupy approximately half the land area of the continent of Europe, it would be difficult to deal with their Slavic-speaking populations as two units divided by political boundaries, since between the two there lies no natural frontier, geographic, linguistic, or racial.

Poland, although largely Slavic, is a nation without ethnic or linguistic unity. The Poles themselves, who are the most numerous single group, occupy most of the western half of the country, interspersed by hundreds of small German islands; the eastern half is divided between Ukrainians in the southern quadrant and White Russians in the northern, with thousands of Lithuanians living in the region of Vilna. In the Ukrainian section the Poles themselves are scattered in small communities as a minority population. (See Map 14.) Poland, and especially Galicia, is the home of the largest body of Jews in Europe; these Jews will be treated in a separate section later.

From the geographical standpoint, Poland resembles Germany. The bulk of the country is a vast, low plain, for the most part exceptionally fertile, separated from the Baltic everywhere except at the Polish Corridor by East Prussia and Lithuania. Toward the south the land gradually rises, until the crest of the Carpathians forms a natural border, comparable to the Alps farther west. Thus, like Germany, Poland is blocked from the south but open to the north and to either side. From West Prussia to Poland to Russia is a natural progression, in which the racial transition is as gradual as the geographical. But from the north to the south of Poland the change is more rapid and more significant, since, while the plain is the home of typical Poles in the racial sense, the Carpathians hold an Alpine-Dinaric population comparable to that of southern Germany. This latter must derive part, at least, of its ancestry from the Bell Beaker people who wandered into the mountains in search of minerals, far to the north and east of most of their fellows.

The plain of Poland was a great center for the Corded people, who

hindered the expansion of the earlier agriculturalists, and whose physical type was predominant there until the adoption of cremation. When burial had once more become fashionable, Poland was largely a Nordic country, as it remained until after the rise and spread of the Slavs, when the old Danubian peasant stock broke through its Corded and Nordic chrysalis and reëmerged.[85] Throughout its history, however, Poland has contained minor incidences of a flat-faced brachycephalic racial type, the Ladogan, whose home lay in the forests and swamps to the north, and which was initially associated with the Kammkeramik hunting and fishing culture. In the living population of Poland, this element has assumed a position of considerable, if secondary, importance.

No nation in Europe has shown greater activity in studying the physical anthropology of its people than has Poland; detailed surveys of many thousands give accurate data on every province, including every village in the Republic. As in parts of Germany and of Russia, we are embarrassed with a plethora of information, to all of which it is impossible to do justice. Our method will be to review the general surveys, and then to study some of the regional populations, including White Russians, Ukrainians, and Carpathian Mountaineers, which overlap the Polish frontiers.

The mean stature for Poland is about 165–166 cm.,[86] medium for Europeans, and close to that of Lithuanians and Carelian Finns. It is tallest (166–167 cm.) in the west, in the provinces of Poznan and Pomorz, in the region of maximum German settlement, including the famous Polish Corridor; this relatively tall stature may not, however, be entirely due to German influence, since the Polish tribes who settled there were as tall as that in the beginning. Shortest statures (164–165 cm.), are found especially in the southeast, in Ukrainian territory; in fact, nearest the supposed Slavic home-land, and in Lodz in central Poland.

The mean weight for Polish recruits is about 140 lbs., moderately heavy for their age and stature. The heaviest live in the eastern part of the country, in White Russian and Ukrainian regions. The bodily proportions of the inhabitants of Poland are similar to those of Lithuanians; the relative span of 105 or more, and the relative sitting height of 53, indicate long arms and long bodies in relationship to leg length. Both shoulders and

[85] It should be stated at the start that Czekanowski's β or pre-Slavic type is to be identified with our Neo-Danubian. Czekanowski correctly considers this to be the basic racial element in Poland, and to have entered the eastern European plains in Neolithic times. Czekanowski, J., *Polish Encyclopedia*, vol. 2, pp. 42–59, Geneva, 1921.

[86] Mydlarski, J., **Kosmos**, vol. 50, #2–3, 1925.

Schwidetsky, I., **ZFRK**, vol. 1, 1935, pp. 76–83, 136–204, 289–314. Schwidetsky's work contains an excellent survey of the subject of Polish anthropology, especially valuable for those who cannot read Polish.

Talko-Hryncewicz, J., **AFA**, vol. 28, 1903, pp. 399–402.

Zakrzewski, A., **ZWAK**, vol. 15, Part 2, pp. 1–39.

hips are, as a rule, broad. The western Poles show less of these lateral features than do the others.[87] Similarly, the northwestern Poles are the flattest chested, the Ukrainians the least so.[88]

Social differences in these characters are greater than regional differences, however; among the upper classes the stature rises to over 170 cm., and the relative span falls to the Nordic level of 102–103. Selection, which is responsible for this differentiation, has also played a great part in the migration of Poles to America; Polish immigrants in the United States have a mean stature of 170 cm., and a relative span of 103.[89] Since social and economic stimuli can so readily segregate different size and bodily form elements in the Polish population, it is not surprising that submerged racial types have reappeared during the course of centuries.

The cephalic index goes down to means of 80 and 81 in various sections of North and West Poland, and up to 85 in Galicia and Ruthenia. The common level for the nation is between 82 and 83. A rise of about 5 index points has taken place since the Slavic settlement, as we have also observed in Bohemia; but the brachycephalizing agents in the two countries are not entirely the same.[90]

The mean head lengths of Poles are about 186 mm., and do not attain or surpass 190 mm. regionally except in selected upper class series;[91] the inhabitants of the northern and western districts of Poland are absolutely longer headed than those of the south and east. The breadth means range from 154 to 157 mm., with a national mean of about 155.5 mm.; the

[87] Baranowska-Malewska, Z., **MAAE,** vol. 14, 1914, pp. 86–109.
Maciesza, A., **ANAW,** vol. 3, 1923, #1.
Mydlarski, **Kosmos,** 1925.
Olechnowicz, W., **ZWAK,** vol. 17, 1893, pp. 1–40; vol. 18, 1895, pp. 29–46; **MAAE,** vol. 2, 1897, pp. 1–31.
Rosinski, B., **Kosmos,** vol. 48, 1923, pp. 302–560.
Rutkowski, L., **MAAE,** vol. 8, 1904, pp. (3)–(68), vol. 13, 1914, pp. 64–95.
Talko-Hryncewicz, J., **TVMA,** vol. 2, 1897, pp. 259–298. Also Résumé in **AFA,** vol. 26, 1899, pp. 203–205.
Wrzosek, A., and Wrzoskowa, M., **MAAE,** vol. 14, 1914, pp. 29–85.
Zejmo-Zejmis, S., **PAn,** vol. 4, 1929–30, pp. 105–108.

[88] Mydlarski, **Kosmos,** 1925.

[89] Davenport, C., and Love, A , *Army Anthropometry.*
Hrdlička, A., *The Old Americans.*
Rosinski, B., **PAn,** vol. 8, 1934, pp. 42–44.

[90] Frankowska, M. z R., *Czaszki z Lwowskiej Katedry Łacinskiej z XVII i XVIII w.;* **Kosmos,** vol. 50, 1925, pp. 649–736.
Hałka, S., **PAn,** vol. 9, 1935, pp. 47–54, 139.
Maciesza, A., **ACIA,** 33me sess., Amsterdam, 1927, pp. 227–231.
Olechnowicz, W., **MAAE,** vol. 3, 1898, pp. 3–21.
Talko-Hryncewicz, J., **MAAE,** vol. 7, 1904, pp. 3–43; vol. 9, 1907, pp. 87–138.
Wrzosek, A., **PAn,** vol. 8, 1934, pp. 56–60.

[91] Rutkowski, L., **MAAE,** 1904, 1914.
Olechnowicz, **MAAE,** 1895.

broadest are in the south, especially in Galicia. The head size of the Poles, as of the Ukrainians and White Russians, is too small to be derived in any considerable measure from an unreduced Brünn or Borreby source; it is also too small for living Nordic populations, and is about equal to that of the Danubian agriculturalists, and of the Alpines and Dinarics. It is at the same time comparable to that of non-Baltic Finns, and of most Lithuanians.

The facial breadths, minimum frontal, bizygomatic, and bigonial, are approximately 108 mm., 143 mm., and 110 mm.; too wide for Nordics or for pure Danubian survivors, and necessitating Alpine, Dinaric, or Ladogan influences, or all three. The menton-nasion face height, with means as low as 118–120 mm. in central and eastern Poland, rises to the full Dinaric height of 127 mm. in Galicia and Ruthenia. Except for these mountainous southern regions, the facial index is uniformly eury- to mesoprosopic. The noses are leptorrhine in most of Poland but approach mesorrhiny in the south and east; there is a progression from means of about 63 in the Polish Corridor and Poznan to 68–70 on the opposite side of the country.

There is abundant evidence to show that all but the southern section of Poland, along the Carpathian foothills, falls within the blondest pigment area of Europe.[92] The skin is almost uniformly light, except in the south; the commonest hair colors are medium to dark brown, and a dark ash-blond. The incidence of truly fair hair is as great here as in Scandinavia, while the eyes are predominantly light-mixed, with gray shades common. Brown eyes seldom exceed 10 per cent except in the very southern mountain sections. With these same exceptions, Poland is too blond a country for Alpines or Dinarics to be present in any numbers. The pigmentation of the population, by and large, is Nordic in shades and in intensity; the virtual absence of rufosity argues against the presence of many Palaeolithic survivors of the types found in western Europe.

Although complete sets of morphological observations on Poles are not common, there is an abundance of data on the form of the nose; the profile is most commonly straight, with a large concave minority, and few in the convex category. The nasal root is usually medium in breadth, the wings medium or slightly flaring; the tip is either horizontal or inclined upward, and, in a large minority of cases, snubbed in a manner highly suggestive of Lapps and eastern Finns. Beard and body hair growth are often on the

[92] See Map 8, Chapter VIII, pp. 270–271.
Sources are those already listed and:
Bochenek, A., **MAAE,** vol. 7, 1904, pp. (101)–(113); vol. 8, 1906, pp. (69)–(76).
Bryk, J., **Kosmos,** vol. 55, 1930, Zesz. I–II.
Dershinsky, J. E., **AFA,** vol. 32, 1906, pp. 234–237.
Talko-Hryncewicz, J., **MAAE,** vol. 13, 1914, pp. 3–63.

light side of the European norm, which fact again precludes a strong Alpine increment.

The facial features which typify the Polish peasantry are quite different, as a rule, from those found among the nobility and the upper classes in general. The noblemen have less blond and less really dark hair; fewer dark eyes, and fewer instances of brunet skin color, than the peasants; their noses, however, present their greatest distinction; these are not only longer and narrower, but also frequently convex in profile, with concave forms reduced to a minimum. Old Corded and Nordic tendencies segregate themselves, at least in stature, bodily build, pigmentation, and facial features, in this superordinate class, as do Danubian and Ladogan tendencies among the peasantry.

Contemporary Polish anthropologists have studied the population of their country by dividing it into types, and plotting the proportions of these types by regions.[93] These types include what would in our present terminology be Nordic, Neo-Danubian, Lappish, Ladogan, Alpine, and Dinaric, as well as Armenoid, and both tall and short Mediterraneans. The last three, however, are admittedly much in the minority, if they are present at all. The Nordic element is strongest in the Polish Corridor, where East Baltic factors, unusual in Poland in our definition of the term,[94] are also found.[95] The Nordic element is also strongest on the German border, and elsewhere it is concentrated along main water courses, the highroads of migration in pre-Slavic Gothic times, as well as later. Its identity with a social and economic upper level, however, is probably stronger than its geographical differentiation. The Neo-Danubian element, which has probably gained in stature through its Nordic interlude, is as blond as the Nordic, on the whole, and this fact leads one to the conclusion that the pre-Corded peasants of eastern Europe, as of the Danube Valley, were already partly blond. The combination of ash-blond hair with gray-mixed eyes seems to be a Neo-Danubian specialty.

Members of the early forest types with their incipiently mongoloid facial features have seeped in everywhere north of the Carpathians, but more in the east than in the west. They too were probably partly blond from the beginning, but not as blond as the Danubians with whom they have become thoroughly blended. Dinarics, commonest in the Carpathians, are found in solution throughout Poland, and the same is true of the Alpines. The rare brunet Mediterraneans noted by the Polish authors

[93] Bryk, J., **Kosmos**, vol. 55, 1930, Zesz. I–II.
Czekanowski, J., *Polish Encyclopedia*, 1921.
Mydlarski, J., **ATNL**, vol. 3, 1924, 78 pp. Résumé by Saller, K., in **AAnz**, vol. 2, 1925, pp. 26–27.

[94] See Chapter IX, section 12, p. 292.

[95] Modrezewski, L. T., **PAn**, vol. 8, 1934, pp. 25–28.

are probably related to the commoner brunet long heads of southern Russia, of Bulgaria, and of the Caucasus, with whom we shall deal later.

The territory occupied by the White Russians is divided between northwestern Poland and the U.S.S.R., with more than half lying on the Russian side. Here it includes not only the White Russian S. S. Republic, but also adjoining districts in the Ukraine, in Smolensk, and to the north. The White Russians have as their neighbors Great Russians, Ukrainians, Letts, Lithuanians, and Poles; although they are Slavic in speech and in tradition, they are physically almost identical with the Lithuanians.[96] They are slightly smaller headed than the Lithuanians, slightly wider in the distance between the eyes, and slightly less leptorrhine; their noses are a little more often concave in profile, up-tilted, and snubbed; their eye openings are more frequently narrow, their lips a little thicker, and their body and beard hair considerably less abundant. Their skins are a little darker, their hair and eyes less frequently blond. In hair color, the Fischer numbers 4, 5, 8, and 26 are the commonest, indicating a prevalence of dark to medium brown and dark ash-blond hair. In eye color, the White Russians have less than 20 per cent pure light, and no more than 10 per cent pure brown. The majority are light-mixed, as with most Slavs and Balts.

The identity or near identity of the White Russians with the Lithuanians makes it very possible that the former were at one time Balts who succumbed to Slavic influences, just as the East Prussians were Germanicized Balts. But the fact is that all of these people, Balts who have been subjected to a minimum of local influences on the Baltic shore, and Slavs who have not been Germanicized, Dinaricized, or influenced by Finns, are so much alike that it is dangerous to postulate specific relationships. The White Russians, with a mean stature of 166 cm., a cephalic index of 82, a nasal index of 69, and a moderate to small head size, are simply the descendants of the Neolithic peasants, an original Mediterranean-Ladogan blend, which has reëmerged through a Corded and Nordic upper crust, so that a Neo-Danubian residue is left. Among individual White Russians Nordics can be found, and semi-mongoloid-looking Ladogans, but the majority follow the Neo-Danubian pattern most closely.

The territory occupied by the Ukrainians is much larger than that of

[96] Hesch, M., *Letten, Litauer, Weissrussen.*

Other sources are:

Eichholz, E. R., Doctor's dissertation in publications of the *Voenno-meditsinskaîa akademiîa*, St. Petersburg, 1895–96. Résumé in **AFA**, vol. 26, 1899, pp. 166–170.

Rodjestvensky, A. N., **RAJ**, vol. 9, 1902, pp. 49–57.

Sobolski, K., **Kosmos**, vol. 50, 1925, pp. 1166–1225.

Talko-Hryncewicz, J., **ZWAK**, vol. 17, pp. 51–172; **TPNW**, 1926. Résumé in **AnthPr**, vol. 6, 1928, pp. 90–92.

Zdroevski, A., **RAJ**, vol. 6, 1905, pp. 127–151.

the White Russians; it includes, beside the whole southwestern quadrant of Poland and the eastern end of Czechoslovakia (the Ruthenians and Goral mountaineers are linguistically Ukrainians), the large Ukrainian Republic of the U.S.S.R., which extends over much of southern Russia to the northeastern end of the Sea of Azov, and large areas outside the Republic in southeastern Russia and the foothills of the Caucasus. Next to the Great Russians, the Ukrainians are the most numerous and most important people in the Soviet Union.

The racial history of the Slavic peoples may largely be interpreted in terms of the previous inhabitants of the countries in which they have expanded. The White Russians are linked with the Balts, and the Great Russians with Scandinavians and Finns, especially the latter; the Ukrainians, in their eastward expansion over the plains of southern Russia, must have absorbed the remnants of the Iranian Scyths and Sarmatians, of the Black Sea Goths, of the Greek colonists of the Euxine shore, as well perhaps as of the mysterious pre-Scythic Cimmerians. It was, furthermore, the Ukrainians who, of all the Slavs, came into the closest relationship with the Turks and Tatars of southern Russia during the Middle Ages. In the Crimea and points east, Ukrainian and Tatar territories are still contiguous. Mixture between Russians and Tatars was not, however, frequent or important in the early days of the Tatar hegemony, when the Slavs kept for the most part to their own farming environment and the Asiatic nomads to their pastures; it has taken place in greater measure during the last few centuries, in consequence of the more recent Slavic expansion eastward over Tatar territory into Siberia and Turkestan.

As is to be expected of a numerous people covering a wide stretch of territory, the Ukrainians are regionally variable in a racial sense. The Ukrainian-speaking mountaineers of southern Poland and eastern Czechoslovakia are more brachycephalic than the others; they will be dealt with presently. The southeastern Ukrainians, in the country just north of the Black Sea, are tall, with regional statûre means as high as 170 cm.; while those in the Volhyn, a district lying between Lwow in Poland and Kiev in Russia, are much shorter, with a mean of 165 cm. Since these Volhynians occupy basic Slavic territory, and since they have been subjected to careful measurement and analysis,[97] they will be treated in some detail here.

[97] Pöch, H., **MAGW**, vol. 55, 1925, pp. 289–333; vol. 56, 1926, pp. 10–52.
Other sources on Ukrainians include:
Beloded, F. S., **AFA**, vol. 34, 1907, pp. 221–223.
Chubinski, P. P., **TESE**, vol. 1–7, 1872–78. Résumé in **AFA**, vol. 12, 1880, p. 398.
Krasnov, A., **RAJ**, vol. 1, #2, 1900, pp. 12–22.
Nosov, A., **ZGTK**, vol. 1, #3, 1932, pp. 37–79.
Talko-Hryncewicz, J., **MAAE**, vol. 2, 1897, pp. 1–60; **ZWAK**, vol. 14, 1890, pp. 1–61.
Tkač, M., **AntrK**, 1929, vol. 2, 1928, pp. 70–103.

In general, the Volhynians resemble the White Russians closely, and differ from them in the same direction that the White Russians differ from the Lithuanians. As one moves southeastward from the Baltic to the Black Sea there is a progressive change from a most Nordic to a most Danubian extreme, within a relatively small anthropometric range. The mean stature of the Volhynians is 164.6 cm.; the relative span of 106 indicates the usual arm and body proportions. The bodily build is thickset to medium, and corpulence, especially with the women, is not uncommon. The mean cephalic index is 82.2, the head length 184 mm., the breadth 151 mm., and the vault height 125 mm.[98] The bizygomatic, 139 mm., is not especially great; the bigonial, 108 mm., comparatively wide. The total face height is 120 mm.; the facial index, 86.6, or mesoprosopic; while the upper facial index is 51.1, mesene. The nasal diameters, 52.5 mm. by 35.5 mm., yield a mean index of 66.5. The moderation of the lateral diameters of the head and face indicate that the Ladogan element, which is so common in other eastern Slavic groups, is at a minimum here. The Neo-Danubian base of the Volhynians is metrically more Danubian than elsewhere.

Most of them have the expected white skin, ranging on the inner arm from von Luschan #7–12, while roughly one-eighth are darker, with brunet-white or light brown shades (von L. #13–16). Vascularity is as common as among most Nordics, and the women, working outdoors, are often red-cheeked. The hair color usually changes with age, as in all prevailingly blond populations; between the ages of 21 and 30, medium brown (Fischer #5, #8) and ash-blond (#26) shades are most frequent; later these darken in many cases. There is little or no truly black hair, and rufosity is almost absent. The beards are as a rule lighter than the head hair, and over 50 per cent of adult males have face hair which is light-blond (Fischer #12–20). About 15 per cent have pure light eyes (Martin #15–16), and 6 per cent pure brown. The commonest shades are light-mixed, however. As is usual in light-mixed eye color populations, the eyes often lose their brown pigmentation progressively with advancing age. On the whole, the Volhynians are a light-mixed pigment group, with the emphasis on ash-blondism and gray-mixed eye shades. Compared with other Ukrainians, they are blonder as well as shorter in stature.

In the morphology of the face, the Volhynians are for the most part typical Neo-Danubians. Median eyefolds, indicative of a low orbit and a heavy fatty deposit in the upper lid, are found among 38 per cent; the nose is concave in 25 per cent of the group, and snubbed in 20 per cent. A heavy deposit of fat on the malars is common, especially among the women; in this type it seems to assume the nature of a secondary sex

[98] The vault height is estimated from Nosov's data.

character. Round faces and plump cheeks are typical. There is, however, a minority which shows Dinaric or Armenoid features; a convex nasal profile, present in 17 per cent of the group, indicates this, as do other nasal and facial characters. This minority Dinaric strain is connected geographically with the population of the Carpathians immediately southwest of Volhynia.

The Ukrainians who live farther east, along the northern shore of the Black Sea, are not only taller than the Volhynians, but also darker in hair and eye color. They are longer faced, but no different in head form, except that in the region of Kiev they are more brachycephalic, with mean indices of 83 and 84. There is a strong Dinaric element in the central and eastern Ukraine, which often in combination with the Nordic and Neo-Danubian takes on a Noric or approximately similar form. Tall, moderately blond, brachycephalic and thin-faced men, are not uncommon here. Individual variation in southern Russia is great; it is easy to pick out, beside the western Ukrainian forms already described and the composite type mentioned, Nordics, Dinarics, and patently mongoloid Tatar hybrids. This variability increases as one proceeds eastward into what is actually Tatar territory.

Before turning to the Great Russian population, we may consider the Slavic-speaking mountaineers of the Carpathians whose territory extends from Galicia to Rumania. These people, whether they live in Poland, Czechoslovakia, or the Bukovina section of Rumania, are known as Ruthenians, and speak dialects of Ukrainian. In southern Galicia they are known as Gorals, or "Mountaineers"; in the southeastern corner of Poland as Huzuls. These people are the descendants of Slavic pioneers who moved into the mountains from the plains to the north and northeast, as early as the eighth century; through isolation and the retention of a relatively primitive way of living they have developed a distinctive culture. Many of them are shepherds, others small farmers.[99]

In the western part of their territory, the mountain people do not differ greatly in most metrical characters from Galicians; they have a mean stature of 164–165 cm., and cephalic indices of 83–84; they are, however,

[99] Sources on the Carpathian mountaineers include:
Demianowski, A., **ANAW,** vol. 1, 1922, #8.
Diebold, V., *Ein Beitrag zur Anth. der Kleinrussen.*
Himmel, H., **MAGW,** vol. 18, 1888, pp. 83–84.
Kopernicki, I., **ZWAK,** vol. 13, 1880, pp. 1–54.
Majer, J., and Kopernicki, I., **ZWAK,** vol. 9, 1885, pp. 1–92.
Suk, V., *Anthropological Notes on the Peoples of Carpathian Ruthenia.*
Talko-Hryncewicz, J. Résumé in **ZBFA,** vol. 16, 1911, p. 205; also **AFA,** vol. 24, 1896–97, pp. 380–385.
Volkov, Th., **BMSA,** ser. 5, vol. 6, 1905, pp. 289–294.
Weisbach, A., **MAGW,** vol. 33, 1903, pp. 234–251.

leptoprosopic with a mean facial index of 90, and face heights of 126 and 127 mm. They are also considerably darker than their equally brachycephalic northern neighbors, with brown or dark brown hair, and eyes which are predominantly mixed, often dark-mixed, in iris pattern. Fully 40 per cent or more seem to have dark eyes, and pure light eyes are exceptional. The skin is definitely brunet-white in over half these people.

The Huzuls differ from the others in the possession of tall stature (170 cm.) and a higher cephalic index (85). They are also noted for their long-limbed, spare bodily build, and the gaunt, high-nosed Dinaric quality of their facial features. The Ruthenians as a whole belong to the Alpine-Dinaric racial group, with the Dinaric factor predominant among the Huzuls; the Slavicization of these mountaineers was more a linguistic than a racial phenomenon. On the other hand, the mutual influences between the early Dinaric inhabitants of the Carpathians and the Slavs have tended in the opposite direction; the strong Dinaric element in the lowland Ukrainian population may be due to a northward infiltration from the mountains.

The Great Russians, the most numerous of the Slavic ethnic groups, are also the easternmost Slavs, and the most recent to spread into their present homes. It was they who pushed northward up the streams of central and eastern Russia, thrusting aside and absorbing the Finnish tribes, until they reached the White Sea; it was they who, with the Ukrainians, served as a bulwark against the invasions of Mongols and Tatars, and who later pushed eastward over Mongol and Tatar territory into Asia. The history of central Asia has been a curious one in the relationship of white and mongoloid peoples; the Turkestans, once wholly white, became partially Mongolized by Turkish and Mongol advances from the days of the Huns through to Kublai Khan. Southern Siberia, however, once sparsely inhabited by mongoloids, received the eastward thrust, first of the Ugrian Ostiaks and Voguls, then of the Great Russians of the sixteenth century, who pushed steadily onward along arable land until they reached the Pacific. Thus in central Asia the current has flowed westward in the southern level, and eastward in the northern. Farther north still, the westward advance of the Samoyeds has added another contrary stream.

Whereas the primary racial influence which acted upon the White Russians was derived from the Balts, and upon the Ukrainians from the Iranians, those which have affected the Great Russians the most have been Finnic in the north, and Iranian in the south. One must not suppose, however, that the northern Great Russians are nothing but Slavicized Volga Finns; there is considerable evidence to indicate that the Slavic colonists advanced in great numbers and reproduced with immoderate fecundity; the Great Russians have been as capable of rapid genetic expan-

sion as of absorption. Their deviation from an ancestral Slavic type is due as much to selection within their own ranks as to the accretion of Finns.

The mean stature of the Great Russians today is about 166 cm.,[100] approximately the same as that of Poles, White Russians, and some Ukrainians. It varies regionally from 169 cm. in the Kuban and Don Cossack country, to about 165 cm. in the Finnish territory between the Volga and the Urals.[101] That selective forces are strongly at play in the determination of the stature level is evidenced by the fact that the Russians who have emigrated to Siberia have attained the mean of 168 cm., while those measured at Ellis Island on their way into America as immigrants reached 170 cm.[102]

Between the twelfth century and 1880 or thereabouts, the stature of the Great Russians, as exemplified by the inhabitants of the Moscow government, had not perceptibly changed, remaining at the level of 165.5 cm.[103] The same cannot, however, be said for the cranial index. A mean of 73.5 typified crania from eleventh and twelfth century Slavic kurgans; Kremlin skulls from the fifteenth and sixteenth centuries had reached 79.6; from then on there has been a steady rise to a mean of 81 for the recent cranial material. This change in head form parallels but does not equal that which has already been observed among Slavs in Bohemia. The brachycephalizing agent was not, however, the same; in Moscow it entered only in the fifteenth century, when fully brachycephalic crania appeared among examples of the older type; the former were much lower and broader faced, and broader nosed. This heterogeneity gradually decreased with the increase of the mean cranial index. There can be no question that the brachycephalizing agent was in its general character not Alpine, in the western European sense, but a separately evolved and incipiently or partially mongoloid Upper Palaeolithic derivative, whether transmitted through a Finnish or a Tatar medium, or both.

The modern Great Russians vary in head form from a mean cephalic index of 78 to 79 in parts of the old Scythian country of South-central Russia to 83 and 84 farther north and east. The mesocephalic and low

[100] Anuchin, D. N., **ZIGO,** vol. 7, vyp. 1, 1889.
Bunak, V., **AZM,** #2, 1932, pp. 1–48.
Snigirev, V. S., **VMZ,** vols. 146–148, 1883.

[101] Bunak, V., **ZfMuA,** vol. 30, 1932, pp. 441–503. To readers unacquainted with Russian, Bunak's work is perhaps the most useful single source on the physicial anthropology of modern Russia.

[102] Baxter, J. H., *Statistics, Medical and Anthropological,* U. S. Army.
Hrdlička, A., *The Old Americans.*
Zeland, N. L., **Anth,** vol. 13, 1902, pp. 222–232.

[103] Derviz, D. V., **RAJ,** vol. 12, 1923, pp. 24–38, French résumé, p. 100.
Stefko, V. H., and Shugaiev, U. S., **AFA,** vol. 50, 1930, pp. 44–55.

brachycephalic index levels represent the usual Danubian reëmergence with the absorption of the old forest types; in the west from an entirely Slavic and in the east from a partially Finnish source. Head dimensions among these Great Russians are medium to small, and comparable to those found among the Volhynians, White Russians, and Finns. The faces of these people are likewise similar to those of the other Slavs mentioned; although they often appear to be wide, the male bizygomatic means rarely exceed 140 mm. The nasal indices usually approach or attain mesorrhiny.[104] There is a great variability in nasal profile, with at least 25 per cent of concavity in most of the country. In pigmentation the Great Russians, like all Slavs previously studied, are predominantly light-mixed, with a tendency to brown and ash-blond hair, and light-mixed eyes. The lightest pigmentation is found in the western part of the Great Russian territory, and blondism decreases gradually to the south and east. The peasants who have migrated to Siberia, however, have taken with them a greater blondism than is typical of most of Russia; over 70 per cent of hair colors lighter than dark brown, and under 30 per cent of brown eyes, characterize the subjects measured in various Siberian districts.[105]

The Great Russians of a special area lying partly in the Tambov, Penza, and Saratov Governments, who form a mesocephalic nucleus in the country half way between Moscow and the mouth of the Volga, have been subjected to a detailed study,[106] which shows them to be essentially Nordic. A mean stature of 169 cm., a cephalic index just under 79, and a head length of 192 mm., indicate an initial resemblance to Nordics or brunet Mediterraneans. The auricular height mean of about 130 mm. is greater than that of Scandinavian Nordics, however, as are the bizygomatic of 140 mm. and the bigonial of 109 mm., while the minimum frontal of 105 mm. is more nearly Nordic than the other lateral dimensions. The face height, 125 mm., yields a facial index on the borderline of mesoprosopy and leptoprosopy; the nasal index, about 65, is derived from a mean nose length of 55 mm. and a breadth of nearly 36 mm.

Half of these Great Russians have wavy hair, the other half straight; the head hair is dark brown (Fischer #4–5) in 30 per cent of the series studied, and almost never black; it is medium brown (Fischer #6–10) in about 50 per cent, and light brown in most of the rest. Rufosity is rare,

[104] Ivanovsky, A. L., **AFA,** vol. 48, 1925, pp. 1–12.
Nicolaeff, L., **Anth,** vol. 41, 1931, pp. 75–93.
Seeland, N., **CRCA,** 1892, pp. 91–154.
Worobjew, B. W., **AFA,** vol. 32, 1906, pp. 223, 238.
Zograf, N. J., **CRCA,** 1892, pp. 1–12; **AFA,** vol. 26, 1900, pp. 860–868; **IILE,** vol. 76, 1892.

[105] Zeland, N. L., **RAJ,** vol. 3, 1900, pp. 75–82; **Anth,** vol. 13, 1902, pp. 222–232.

[106] Debetz, G., **AZM,** 1933, pp. 34–57.

but at the same time most of the blondism falls on the golden side. About 8 per cent have brown eyes, nearly 30 per cent light, and the rest mixed. Thus these tall, mesocephalic Great Russians are brown to dark brown-haired, and essentially mixed to light eyed. Their facial features conform in most cases to a Nordic standard; the nasal profile is straight or wavy in over 65 per cent of the group, convex in 25 per cent, and concave in the 10 per cent that is left.

Individually as well as collectively, most of these men look Nordic in either a complete or a partial sense; others, in the minority, with concave, up-tilted noses and wide faces, approximate the forest type of incipiently mongoloid trend. The facial dimensions, with their accent on the heaviness of the mandible, diverge from a western European Nordic standard, but conform to that of the eastern Nordic type found skeletally among Scythians and in the Minussinsk kurgans; they also conform to a brunet Mediterranean type which we shall see in other regions bordering the Black Sea. The high vault, and the prevalence of brown hair in combination with light eyes, suggests a major survival of the Corded element so lacking elsewhere in most of eastern Europe; since the Slavs elsewhere have to a large extent lost this element, it seems likely that the people in question are the descendants of earlier Iranian inhabitants as much as of Slavic immigrants.

North of the grasslands, in the old forested country, the Great Russians resume their expected racial character, and their resemblance to White Russians, western Ukrainians, and Poles. The difference between eastern Great Russians, living in Finnic territory, and the indigenous Finns, may be seen by a comparison between Cheremisses and Mordvins, on the one hand, and their Russian neighbors.[107] The Russians are taller than Cheremisses but shorter than Mordvins; hence no distinction may be made on the basis of stature. The relative sitting height is the same, as are the head length, head breadth, head height, and the total face height. The bizygomatic of the Russians, however, is 138 mm., as compared to 140 mm. for Cheremisses and 141 mm. for Mordvins; the nasal index of the Russians is 64, that of the Mordvins 65, of the Cheremisses 71. Thus the only differences that can be seen anthropometrically are those which concern the breadths of the face and nose, and these only to a slight degree.

There is a real difference, however, which appears in observational characters; only 34 per cent of Russians have weak beard growth, as compared to 64 per cent of Mordvins and 77 per cent of Cheremisses; 22 per cent of Russians have a median eyefold, which is found among

[107] Bunak, V., **RAJ**, vol. 13, 1924, pp. 178–207; also résumé in **AAnz**, vol. 2, 1925, pp. 109–110.
Sergeev, V. I., **PCZA**, 1931, pp. 318–319.

34 per cent of Mordvins, and 46 per cent of Cheremisses; only 12 per cent of the Russians have concave nasal profiles, as compared to 18 per cent of Mordvins, and 39 per cent of Cheremisses. Furthermore, only 36 per cent of Russians are brunet in total complexion type, while 50 per cent of Mordvins, and 69 per cent of Cheremisses, are so identified. The conclusion to this is that the Great Russians living in Finnish territory in eastern Russia, although they have absorbed much Finnish blood, have not wholly lost their Slavic character, and have acquired fewer mongoloid or incipiently mongoloid soft part features than have the Finns.

The traveller in Moscow, or in any other important Russian city, is struck by the diversity of racial types met not only on the street but also in any other place or circumstance. The broad-faced, snub-nosed Russian peasant, with his shoulder-length head hair and beard, has, since the revolution, lost much of his hirsute adornment; deprived of these distinctive properties, he ceases to look as strange or as distinctive as before. His hairiness, famous in caricature, is for the most part due to custom rather than to pilosity, since beard growth among Great Russians is no more abundant than among most other Europeans.

Beside the snub-nosed peasant type, one sees on the streets of Moscow Nordics who would be at home in Sweden or in England; Dinarics, Norics, and every variety of near and distant mongoloid. There are also occasionally tall, large-headed, and large-faced men who are East Baltic in our present sense, and some rare Mediterraneans other than Jews. Although many of these individuals of varied type come from far corners of the Russian Empire, there is a considerable mobility, and a juxtaposition of varied types in the same place. Russia is a new country from the standpoint of migrations and settlement, when compared to the rest of Europe; she resembles in her population phenomena rather the United States or Canada. There are still many unabsorbed or only partially absorbed peoples within her European, not to mention her Asiatic, borders.

(10) TURKS, TATARS, AND MONGOLS OF EUROPEAN RUSSIA

In estimating the influence of the Turks, Tatars, and Mongols upon the Finns and Slavs of European Russia, it is customary to assume that these peoples are, or at least were, fundamentally mongoloid in race. It will therefore be useful to examine the documents concerning the living representatives of these Asiatic peoples. We have already studied the skeletal remains of their ancestors (Chapter VII), and therefore know that the early nomads of the central Asiatic plain were European in type, and that many could be classed under the term Nordic, with a strong Corded increment.

With the destruction of the Hiung-Nu empire of Mongolia by the

Chinese, the Huns began their westward migration, finally arriving in and crossing Europe. These Huns, as we have seen, were mostly mongoloid, of the primitive Tungusic variety, but the Avars who followed them belonged more to the Buryat-Mongol type. With the Hunnish and Avar chiefs were many followers of the old central Asiatic Nordic race, and mixed retainers of a pseudo-Armenoid or Dinaric cranial form, caused, without reasonable doubt, by a Mongol-Nordic or other Mongol-European hybridization. This medley of peoples, known as Turks or Tatars, invaded eastern Russia intermittently during the first 1500 years of the Christian era, before the tide turned, and the Slavs began the last leg of their eastward expansion. Besides those of the Turko-Tatars there were invasions of full-fledged Mongols, including the Kalmucks, whose descendants still pasture their flocks on the western side of the lower Volga, just north of the Caucasus. For purposes of facility in treatment, I have divided the Altaic speakers of European Russia into four groups: (a) Turkicized Finns and Ugrians, including the Chuvash, Bashkirs, and Meshcheryaks; (b) the Tatars in general, including all of the Turkish-speaking, mostly Moslem peoples of eastern Russia, from the Perm government down to the Caucasus; (c) the Crimean Tatars; and (d) the Kalmucks.

The Chuvash, who live in various parts of the former governments of Kazan, Simbirsk, Samara, Saratov, Orenburg, and Perm, number nearly half a million,[108] of whom some 116,000 live in what is now their own administrative district.[109] These are near neighbors of the Mordvins, and like the Bashkirs, who are historically survivors of the old Bulgar Empire of the Middle Ages, are probably the results of an early Turkic-Finnic cross.

The Chuvash are metrically similar to the Mordvins, but differ from these latter in the opposite direction from that in which the Mordvins differ from the Russians; in other words, in most metrical and morphological characters, there is a progression from Russians to Mordvins to Chuvashes. Their mean stature is about 164 cm., their cephalic index 80.5, their facial index 85, and their nasal index 71. They are thus shorter, longer headed, wider faced, and wider nosed than the Mordvins, and proportionately more so than the Russians. Only 2 per cent have black hair, 50 per cent dark brown (Fischer #4–5), and the rest almost entirely medium brown (Fischer #7–9). Pure brown eyes are confined to 19 per cent, and most of these are light brown; pure light irises to 3 per cent, although predominantly light ones total 14 per cent. Thus, while darker than the Mordvins, they are almost wholly a mixed pigment group.

[108] Jochelson, W., *Peoples of Asiatic Russia*, pp. 20, 21.

[109] Vishnevski, B. N., *Antropologicheskoe izuchenie chuvashi, K Otchetu po Issledovaniĭam*, 1927, pp. 229–252.

Vishnevski is the source for the anthropometric data which follow.

The Chuvash are not simply Finns Tatarized in language, but show evidence in face form, nose form, and in the scarcity of true blondism, that the Turkish influence did bring some mongoloid traits. It is interesting to note, however, that the cephalic index was not elevated as a result. Individually the Chuvash are extremely variable, as their portraits (see Plate 3) will show; complete Nordics of Corded tendency, and unmistakable mongoloids represent the end types, both of which may have been brought by the Turks.

There are two other peoples living in the general region between the Volga and the Urals, and partly on the other side, who fall into the same general Turko-Finnic class; these are the Bashkirs and the Meshcheryaks. The Bashkirs are Moslems, some of whom are settled, while others are cattle nomads; still others hunt and trap for furs in the mountains and forests. In the thirteenth century they are said to have been still speaking the same language as the Hungarians,[110] which must have been some form of Ugric. At that time they were both enemies and rivals of the Bulgars and Petchenegs. The Meshcheryaks, who formerly inhabited the Oka basin, were probably Finns; they split into two branches one of which moved westward and became Russified, the other eastward and Turkicized. Traces of the western branch may be found among the Russian-speaking population of the Penza and Tambov regions; the eastern branch has taken over the speech, religion, and habits of the Bashkirs, with whom they live and are closely identified. For present purposes only the eastern branch will be studied; the western branch is a part of the Great Russian ethnos.

The two peoples, Bashkirs and Meshcheryaks, are physically much alike, and not greatly different from the Chuvash.[111] The Bashkirs are the taller, with a mean stature of 166 cm.; that of the Meshcheryaks is 164–165 cm. Both are as a rule long-bodied, with a relative sitting height of over 53, well-muscled and robust, with wide shoulders. The Bashkirs are brachycephalic, with a mean index of 83.5, while the Meshcheryaks run between one and two points lower. The Bashkirs have heads of moderate vault dimensions, and are comparable in this sense to the Volga Finns, rather than to the larger-headed central Asiatic Turks and Mongols. Their faces, however, are larger than those of most eastern Finns; breadths of

[110] On the authority of those two intrepid and observant churchmen, John Plano de Carpini and William of Rubruck.

[111] Maliev, N., **TKU,** vol. 5, #5, 1876. Résumé in **AFA,** vol. 10, 1878, p. 434.
Nazarov, P. S., **IILE,** vol. 68, #9, 1890, Col. 350–367.
Nikolski, D. P., *Bashkiri.* Résumé in **RAJ,** vol. 1, 1900, pp. 116–118.
Sommier, S., **APA,** vol. 11, 1881, pp. 255–296.
Weissenberg, S., **ZFE,** vol. 24, 1892, pp. 181–233.
Zograf, N. J., **AAM,** vol. 3, 1879, pp. 7–23; résumé in **AFA,** vol. 14, 1883, p. 294.

109 mm. for the minimum frontal, 143 mm. for the bizygomatic, and 112 mm. for the bigonial, approach a Turko-Mongol standard, especially in the excess of jaw width over that of the forehead. The total face height of 122 mm. lies closer to the Finnic and to the Mongol than to the Turkic mean. Various groups of Bashkirs have nasal index means ranging from 67 to 73; a low mesorrhiny is apparently usual. A mean interorbital distance of 33.5 mm. is greater than among most Europeans. In all of these metrical characters of the head and face, the Meshcheryaks differ slightly from the Bashkirs, in each case in a Finnic direction. They have thus been less thoroughly Turkicized racially than the Bashkirs.

Over 50 per cent of the Bashkirs have black hair, and over 75 per cent dark eyes. Of the latter, a large minority are black. What blondism the Bashkirs possess seems to be of the gray-eyed ash-blond variety. Fifteen per cent have convex nasal profiles, which in this particular case implies Turkish influence; about 20 per cent have the snubbed tip typical of Finns but not of Mongols. The Meshcheryaks seem to be blonder than the Bashkirs, and consistently more Finnish in every respect. A distinction is usually made between the sedentary and forest Bashkirs, who are taller, longer faced, and more frequently aquiline-nosed, and the pastoral Bashkir, who are shorter in stature, broader faced, and more mongoloid-looking. That there may be some such regional differentiations seems likely.

Before proceeding further with the examination of Turko-Tatar peoples in eastern and southern Russia, it may be well to study their central Asiatic prototypes, as exemplified by the Kirghiz-Kazak whose home is in the Altai Mountains[112] but who also graze their flocks on the Aralo-Caspian plain. The Kirghiz are a pastoral nomadic nation par excellence, of Turkish antecedents but with a strong Mongol infusion; in this respect they may be considered to resemble the Turkish-speaking invaders of eastern Europe in earlier times. They are variable in stature but usually short, with group means ranging from 160 cm. to 165 cm.; they are exceptionally long-bodied and short-legged, with a relative sitting height of 54.7, higher than that of any European people whom we have studied.

They are completely brachycephalic, with a mean cephalic index of 85 for most groups, and their heads are of considerable size. A mean length of 188 mm., a breadth of 161 mm., and an auricular height of 128 mm. indicates a larger vault than those of eastern Finns or Tatarized Finns, as large as or larger than the heads of western European Alpines,

[112] Baronov, S. F., Bukeĭkhan, A. N., and Rudenko, S. I., *Kazaki, Antropologicheskie ocherki.*
Iarcho, A. I., **SAM,** #1–2, 1930, pp. 76–99.
Oshanin, L. V., **ITL,** vol. 10, 1927, pp. 233–270.
Roguinski, J., **AZM,** 1934–35, pp. 105–126.

but smaller than the heads found in northwestern Europe among Borreby descendants. The faces are absolutely large, with a mean height of 125 mm., which is comparable to that found on Nordic groups, and a bizygomatic breadth mean ranging tribally from 148 to 153 mm. The last named breadth is typical of pure Central Asiatic Mongols, who are, however, shorter than the Kirghiz in absolute face height (120 mm.). Thus the Kirghiz face seems to be a hybrid one in its differential inheritance of dimensions, having received its breadth from a mongoloid ancestry, its height from a white. However, since a total face height mean of 133 mm. is found among living Tungus, the Turkish face height may also be partly derived from an alternate Mongoloid source; this must be mentioned as a possibility, but, in view of the absence of other Tungusic features, it is unlikely. The Kirghiz are long-nosed, with a mean nasal height of over 55 mm., and a nasal index of 67. In this respect they differ from the shorter-nosed, messorrhine Mongols, and from some of the incipiently mongoloid Volga Finns.

Few of the Kirghiz have pinkish-white, northern European skins; the ratio of these is under 5 per cent. Brunet-white and light brown skins account for some 33 per cent of the whole, while the rest, over 60 per cent, have a yellowish tinge of varying intensity, associated with varying degrees of pigmentation. No Kirghiz are really darker than light brown, however; von Luschan #15 seems to be the darkest shade on their normal range.

The hair color is black in 50 per cent of the Kirghiz; only 4 per cent are lighter than dark brown, and complete hair blondism is extremely rare. About 55 per cent have pure dark eyes, mostly dark brown with nearly 10 per cent of black; about 7 per cent or fewer are light-mixed or light, while the rest are dark-mixed. In series studied without scales, the pure darks are listed as high as 93 per cent; hence the majority of the mixed group must be dark-mixed indeed. The Kirghiz are predominantly brunet; they show no more blondism than many brunet Mediterranean peoples in Africa and Asia, but here the blondism definitely implies a Nordic or other blond racial increment, for there is no minority incidence of blondism among fully evolved, unmixed mongoloids. The presence of a submerged blond strain among the Kirghiz is clearly shown by the presence of 14 per cent of beards lighter than dark brown, a ratio 10 per cent higher than that for head hair color. The white strains that went into the Kirghiz blend were probably predominantly blond.

The prevailingly mongoloid character of the Kirghiz in their superficial or soft part anatomy is clearly seen by a study of hair abundance and hair distribution. Hair is absent from the chests and abdomens of 93 per cent of adult males; in the rest it is scanty. Arm and leg hair is absent

from 14 per cent, present in a minor degree on the shins only with 78 per cent; the remaining 8 per cent have a certain amount of hair on arms and thighs. The beard, not including the mustaches, is actually absent among 10 per cent of adult males, scanty with 56 per cent, and abundant with only 9 per cent. It is situated on the chin only with 26 per cent, on the lower jaw as well, under the jaw line, with 40 per cent more, and on the lower part of the cheek also with the remaining 34 per cent. In no instance studied did it cover the cheek profusely. The mustache is absent among 3 per cent, scanty among 55 per cent. The head hair is frequently coarse, almost always straight; the beard hair is wavy in 23 per cent of instances. The sparsity of body and beard hair is not as marked among most Kirghiz as among complete mongoloids, but it falls nearer a mongoloid than a white extreme.

In the form of the external eye, however, the Kirghiz are not notably mongoloid; only 15 per cent have the epicanthic fold, as compared to 83 per cent of Buryat-Mongols. Eye obliquity is found in 38 per cent, however, and the eye slit is characteristically narrow. Straight or vertical foreheads, common among Buryats and Mongols, are uncommon among Kirghiz; the slope is as great as that among Nordics and other Europeans. Browridges, usually but slightly developed among Mongols, are often medium to heavy among Kirghiz. In malar form, however, the Kirghiz tend in a mongoloid direction, since over 80 per cent protrude prominently forward. Lips are usually thin or medium.

The greatest morphological difference between Kirghiz and Mongols lies in the architecture of the nose; while the root is only of moderate height, and frequently broad, the bridge is often quite high, and the nasal profile is convex in 50 per cent of cases; the rest are almost entirely straight. Thus the lightly concave mongoloid profile is notably rare, except among women and children. The nasal tip is often thick, and is inclined downward in some 30 per cent of cases; the wings are moderate to flaring, the nostrils often highly excavated, and set usually at an oblique angle to the axis of the septum.

This pseudo-Armenoid or Armenoid-looking nose, typical of the Kirghiz if by no means found among all of them, differs from the true Dinaric or Armenoid organ in the fact that its root is usually low, while its bridge height is frequently great only by comparison. It is obviously a hybrid nose, just as the dimensions of the Kirghiz face suggest a hybrid origin. The pseudo-Armenoid skulls of the Medieval Avar and Turkish cemeteries of eastern Europe and Hungary are thus explained as a consequence of the mixture of the Buryat-Mongol mongoloid variety with white men presumably to a large extent Nordic, on the central Asiatic grasslands. This Kirghiz Turkish hybrid form is, furthermore, a phenomenon parallel

to the formation of Norics in central Europe, and of Dinarics and Armenoids themselves elsewhere.

Let us return to the Tatars of eastern and southern Russia, other than the Tatar-Finnish and Tatar-Ugric mixtures whom we have already studied. These include numerous scattered peoples from the Bashkir country down to the foothills of the Caucasus, and living, in its southern reaches, on the western side of the Volga. With the exception of the Kassimov Tatars in the government of Rjäsan, who are said to be Tatarized Finns, like the Chuvash and Bashkirs,[113] and who resemble the latter closely, most of these Tatar groups conform fairly well to the Tatar standard as exemplified by the Kirghiz. As a whole, however, they are less frequently yellow-skinned; their eyes are pure brown in only 53 per cent of a composite group studied; the hair is black or dark brown in only half the total, while medium brown shades account for most of the rest. Deviations from a Kirghiz standard result from the absorption not of Finns, but of the remnants of Iranian tribes, and of other early occupants of the southern steppe country. This will be made clear when we come to study the Turkomans and other Turkish-speaking nomads of former Iranian territory in what is now Russian central Asia.

The peninsula of Crimea, which lies immediately south of Ukrainian territory, represents the most distant outpost of the Tatars in a southwestern direction, except for their colonies in Rumania and Bulgaria. The history of the Crimea is one of many radical changes of ownership; the Cimmerians were driven to the mountains by the Scythians in the seventh century B.C.; subsequently Greeks colonized the peninsula in large numbers, and it remained largely Greek until overrun by Goths in 250 A.D. We have already seen (Chapter VI, p. 206) that these Goths faithfully preserved their Germanic skeletal character as long as they kept their ethnic identity. Huns and Khazars followed the Goths, and later Byzantines, Kipchak Turks, Mongols, and Italian merchants, all had their share in the possession and exploitation of the Crimea. The Tatars began their settlement in the thirteenth century, and became the principal inhabitants, flourishing especially under Ottoman Turkish domination. When the Crimea became Russian territory in 1783, many of the Tatars migrated to Turkey.

There are still Greeks in the Crimea, as well as some Bulgarians, Germans, Albanians, Karaite Jews, and, of course, Russians. The Tatars, however, still make up the bulk of the population. These are divided into

[113] Benzengre, B., **RDAP**, ser. 2, vol. 2, 1881, pp. 211–221.
Nefedov, J. W., **AAM**, vol. 1, 1879, pp. 200–201, 320–322. Résumé in **AFA**, vol. 14, 1883, p. 291.
Talko-Hryncewicz, J , **AFA**, vol. 34, 1907, p. 224.
Willer, O., **PAn**, vol. 1, 1926, pp. 84–91.

the Coastal Tatars, who have been very much mixed with other peoples, the Mountain Tatars, and the Tatars of the steppe regions, away from the southeastern coastal highlands.

In some respects there is a considerable difference between these groups; the Steppe Tatars are the shortest, with a stature mean of about 164 cm., and are brachycephalic (C. I. = 85); they resemble closely their relatives the Nogai Tatars, many of whom live near the Kalmucks in the territory north of the Caucasus.[114] (See Map 16.) On the whole, they seem to be more frequently mongoloid than the rest of the Crimean Tatars. The coastal and mountain groups are both taller, with regional means rising as high as 170 cm., but with the general level situated at 167–168 cm. All, however, are brachycephalic, with cephalic index means of 84 and 85; the facial dimensions are moderate, and white rather than mongoloid. They are predominantly brunet, with over 50 per cent of dark eyes, and 65 per cent or more of black and dark brown hair color. This brunet pigmentation, however, may have been derived from a number of sources, as may the brachycephaly of this people. They are a very mixed group, and show little morphological evidence of their partially mongoloid ancestry.

The Kalmucks, who pasture their cattle on the Astrakhan steppe to the west of the mouth of the Volga, are a relatively pure Mongol people, transplanted from central Asia, who have retained their original speech and manner of living in their new home. They have preserved the moderately short stature, 164 cm., of the native Mongolians, but are less brachycephalic, since their cephalic index mean is 83, while that of the Mongols at home is about 85.[115] In their facial dimensions, including a mean bizygomatic diameter of over 150 mm., they are fully Mongolian, as they are likewise in skin color, in hair form and texture, and in hair pigmentation. Their noses, whether concave, straight, or convex in profile, are usually low-bridged; their malars prominent, their eyes frequently bordered by epicanthic folds. Although some mixture with Russians and Tatars must inevitably have taken place, this cannot have been extensive, and has not sufficed to deprive them of their essentially Mongol racial character.

[114] Kharusin, A. N., **IILE,** vol. 68, 1890, fasc. 7, col. 249–288; fasc. 8, pp. 303–322. Résumé in **Anth,** vol. 3, 1892, pp. 481–482; also **AFA,** vol. 26, 1900, p. 831.

Nosov, A., **Antrk,** 1929, vol. 2, 1928, pp. 9–69.

Poschen, P., **RAJ,** vol. 8, 1912, pp. 36–42. Rev. in **ZBFA,** vol. 17, 1912, pp. 274–275.

Talko-Hryncewicz, J., **MAAE,** vol. 7, 1904, pp. 3–100.

Tebebinskaïa-Schenger, N., **RAJ,** vol. 17, 1928, pp. 12–53. Résumé in **Anth,** vol. 39, 1929, p. 408.

[115] Korolev, S. R., **AFA,** vol. 32, 1906, pp. 90–92.

Vorobiev, V. V., **AFA,** vol. 32, 1906, pp. 87–90.

The foregoing survey of Turkic and Mongolic-speaking peoples on European soil, with an excursion into Asia for purposes of comparison, has served to define the racial elements which these people have brought with them into the European racial corpus. Except for the first Hunnish and Avar inroads, and the late invasions of the Mongols themselves, pure Mongols were seldom involved; a mixed mongoloid-white type, already partly formed in central Asia, was the principal racial factor.

(11) THE MAGYARS

There are approximately eleven millions of Hungarians in Europe, of whom some eight million live within the boundaries of their own kingdom; three million have been placed in exile by the Treaty of Versailles. These three million inhabit (or inhabited) the adjacent nations of Czechoslovakia, Yugoslavia, and Rumania, most notably the latter, where a large bloc of Magyars, the Szekelers, live in Transylvania, under the curve of the Carpathians. Other groups are scattered widely between the Carpathians and the boundary of present Hungary.

The history of Hungary, reviewed in Chapter VII, has been one of extraordinary complexity. Within the Christian era the Hungarian plain has witnessed the invasion and settlement of numerous Slavs, Germans, Huns, Avars, and Ugrian Magyars; the introduction of foreigners of all kinds by the early Hungarian kings in their efforts to create a highly civilized state added further confusion. Out of this medley of peoples with their many languages and cultures, one speech, a partially Turkicized Ugric, has survived; one dominant cultural pattern has arisen; this seems partly Slavic, partly central Asiatic, and Romanized through the agency of Catholicism.

The ethnic structure of Hungary is extraordinarily complex, and as yet not wholly known. Many small sub-groups, located in various parts of Hungary and elsewhere, claim special descent, not from Arpad and his followers, but from the Avars, the Cumans, and other Turkish invaders. The Szekelers, who are claimed to be the purest of the Magyars, in the sense that they preserve the ancient types most faithfully, are descendants of colonists sent to the Carpathians to ward off the inroads of the Cumans. These various traditions and individual histories indicate that the formation of the Hungarian people was no simple matter.

Almost every race or sub-race in Europe, and many in Asia, have contributed to the Magyar physical amalgam, and an adequate anthropometric study of the Hungarians would be a task of great magnitude. So far such a study has not been made, or at least, has not been published. Contemporary Hungarian anthropologists have concentrated rather upon the prodigious task of untangling the skeletal history of their country,

with considerable success, as reviewed in Chapter VII. With this ample background, the analysis of the living material which they have accumulated and are accumulating will be made possible.[116]

The stature of living Magyars within the present kingdom of Hungary varies but slightly from region to region; local means run from 167 to 168 cm. The same is true of most of the Hungarian districts in Rumania, except for the Transylvanian Magyars, whose mean is 169 cm., and the Szekelers, with 170 cm. Thus the Magyars are taller than either the Ugrians or the Turks of eastern Russia, with a tendency for stature to increase from west to east.

The cephalic index mean maintains a brachycephalic level of 84 to 87, with the highest figures in the southeast, in the neighborhood of Szeged and Arad; on the whole, excessive brachycephaly is a South Hungarian phenomenon. The tall Szekelers of the bend of the Carpathians have the low mean, for Magyars, of 81.5. Head sizes of Hungarians are of normal, central European dimensions; the more brachycephalic groups have the larger heads, with length means in the neighborhood of 185 mm., and breadths of approximately 158 mm. They are thus equivalent to most Dinarics and Alpines in this respect. The less brachycephalic groups farther north have lengths of approximately 181–182 mm., and breadths of 152–153 mm.; figures of Neo-Danubian size. The Szekelers, by contrast, have large heads, with length and breadth means of approximately 191 mm. and 156 mm. If they have more Asiatic blood than the other Magyars, it must be Turkish in the sense of the Turkomans and Azerbaijanis.

Small series of Hungarians, taken as a whole, show fully European cranial and facial dimensions. Total face heights of less than 120 mm. are reminiscent of Ugrians as well as of modern Slavs, and are too short for either central Asiatic Turks or Dinarics. The mean bizygomatic diameter of 140 mm. precludes, furthermore, extensive Mongol or Turkish influence. A moderate leptorrhiny, with a mean nasal index of 68, is too high for Dinarics, but adequate for Neo-Danubians, Turks, or Alpines.

[116] Sources on the physical anthropology of living Hungarians include:

Bartucz, L., **REHF**, vol. 5, Paris, 1927, pp. 209–241; **ZFRK**, vol. 1, 1935, pp. 225–240; **MAGW**, vol. 57, 1927, pp. [126–130]; **NMNM**, vol. 7, 1911, pp. 278–292; **AFA**, vol. 43, 1917, pp. 44–59.

Benyon, E. D., **GR**, vol. 17, 1927, pp. 586–604.

Biasutti, R., **APA**, vol. 51, 1921, pp. 154–184.

Hermann, O., **MAGW**, vol. 35, 1905, pp. 53–63; vol. 49, 1919, pp. 3–5.

Hrdlička, A., *The Old Americans.*

Janko, J., *Magyar Typuszok, Elsö Sorozat: A Balaton Mellékéröl.*

Korosi, M., **BSAP**, ser. 3, vol. 1, pp. 308–309.

Scheiber, S. H., **AFA**, vol. 13, 1881, pp. 233–267; **CRCA**, 8 me sess., Budapest, 1876, vol. 1, pp. 601–611.

Talko-Hryncewicz, J., **PAn**, vol. 6, 1932, pp. 26–32, 118–119.

On the whole, the metrical characters of the Magyars, as revealed by small and perhaps poorly representative samples, indicate Neo-Danubian and Alpine racial elements as the most prevalent, especially the former.

The pigment characters, judging from what has been published, are on the brunet side of medium; over 50 per cent of eyes seem to be dark or predominantly dark, while black and dark brown hair shades reach approximately the same figure. The majority of Magyars have straight nasal profiles; a large minority of 25 per cent are concave, however, and a few of these are flattish in a manner which suggests ultimate Finnic or mongoloid derivation. Nasal convexity is not common, at least in the small series available.

According to Bartucz's analysis, only about 15 per cent of the population of Hungary is Alpine racially, and this element is commonest in the German territories of the southern part of the kingdom. A Neo-Danubian racial type[117] is the most numerous single element, which accounts for about 35 per cent of the whole, and is commonest in the northeast, over against Slovakia, and in this section it rises to 60 per cent of the population. Dinarics include 20 per cent of the total and are concentrated in the south and especially the southwest, in contact with essentially Dinaric regions in Yugoslavia.

Bartucz finds about 20 per cent of the Magyars to show evidence of Asiatic Turkish blood, in the relatively non-mongoloid sense, while about 5 per cent manifest clearly recognizable mongoloid features. These Asiatic elements are not evenly distributed, but are concentrated in the purer Hungarian pastoral population, while the Turkish element is said to be especially visible in the nobility. The 5 per cent which remains after Bartucz's partitionment must include Nordics and Norics, with the latter also forming part of the Dinaric allotment, as well as a few brunet Mediterraneans.

Bartucz's analysis, based upon long observation as well as upon unpublished materials, is more valid than deductions made from the small series of detailed measurements at our disposal. Hungary fits into the racial boundaries of the countries which surround her, without sharp transitions; at the same time she provides a refuge in central Europe for a minor central Asiatic survival. It is not accurate to say that the pre-Magyar inhabitants of Hungary have completely, or almost completely, absorbed the invaders whose speech is that of the nation, for the Ugric followers of Arpad, who came to these plains in thousands, must have been largely Neo-Danubian in race, as are many of their present-day descendants and successors.

[117] Bartucz calls it *Oriental.*

(12) THE LIVING SLAVS (*Concluded*)

(c) *Serbs, Croats, and Slovenes*

If the Treaty of Versailles was bitter to the Magyars, it was more than bountiful to the southern Slavs, the Serbs, Croats, and Slovenes, whom the Magyars cut off, centuries ago, from their northern linguistic kinsmen. The present kingdom of Yugoslavia includes almost the totality of the three Slavic peoples mentioned, but also hundreds of thousands of Magyars, Bulgarians, and Albanians, to mention merely the more numerous of the subject minorities. Geographically, Yugoslavia is for the most part mountainous; culturally, it covers the entire range from the sophisticated civilization of central Europe to the Early Iron Age survival of the Balkan highlands.

Among the Yugoslavs, religion as well as language forms a source of division; the Croats and Slovenes are Catholics, the Serbs are mostly Greek Orthodox. Under the term Serb are included, however, such diverse peoples as the Serbs Proper, the Montenegrins, the Bosnians, the Herzegovinians, and the Dalmatians. The Bosnians and Herzegovinians include large minorities of Moslems and Catholics, and the latter are particularly numerous in Dalmatia. Aside from the Serbs Proper, only the Montenegrins, whose religion served for centuries as a symbol of resistance to the Turks, are almost to a man Greek Orthodox.

Neither language nor religion, however, nor general type of civilization, has much bearing on the problem of race in Yugoslavia, since within this kingdom lies the concentration point of the entire Dinaric racial zone, which has its western terminus in Austria, Switzerland, northern Italy, and southern Germany, and its eastern in Albania. This Dinaric zone closely follows the mountain chain which borders the Adriatic, and is centered in Montenegro. It is the primary function of this section, and of that on Albania which follows, to dissect this Dinaric nucleus and to elucidate the Dinaric problem. We shall consider in turn the following segments of the southern Slavic nation: Slovenes, Croats, Serbs, Bosnians, Herzegovinians, Dalmatians, and Montenegrins.

The Slovenes,[118] who are the westernmost of the southern Slavs, are linguistically closest to the Croats, whom they border on the south and east. They arrived in their present territory in the seventh century A.D., and absorbed the remnants of the Keltic and Illyrian peoples who had persisted in one form or other through the invasions and turmoils of the preceding centuries. Their chief area is the former Austrian province of

[118] Biasutti, R., **APA,** vol. 51, 1921, pp. 154–184.
Ćwirko-Godyki, M., **RDAP,** vol. 41, 1931, pp. 105–120.
Škerlj, B., **ZFMA,** vol. 28, 1930, pp. 213–237; **AAnz,** vol. 8, 1932, pp. 126–143; **AnthPr,** vols. 1–2, 1927, pp. 55–91.
Weisbach, A., **MAGW,** vol. 33, 1903, pp. 234–251.

Carniola, where they form 94 per cent of the population; beyond its borders they extend into Styria and Carinthia, and in the south they occupy part of the peninsula of Istria.

In stature, head form, and pigmentation, they cannot be distinguished from the Austrians upon whose territory they touch; their mean height being 168 cm., their cephalic index 83.4, and almost half having medium brown to blond hair, while light and light-mixed eyes total nearly 70 per cent. The length and breadth dimensions of the head, however, fall at the small end of the Alpine and Dinaric ranges, with means of 183 mm. and 154 mm.; furthermore, their facial dimensions are rather small, with a total face height no greater than 120 mm., and a bizygomatic diameter of 140 mm. A nasal index of 68 is accompanied by a 25 per cent incidence of concave nasal profiles.

The metrical characters detailed above indicate that while the stature and head form of the general Dinaric area are approximated by these Slavs, the Neo-Danubian type which has reëmerged so completely in northern and eastern Slavic territory is also to be reckoned with here. The Slovenes provide a partial breach in the Dinaric racial continuity, comparable to that provided by the Germanic element in Austria.

This continuity is, however, partially restored by the Croatians,[119] who, with a mean stature of 170 cm., and a mean cephalic index of 85, are intermediate in many respects between the Slovenes and the Serbs. The pigmentation of the Croatians is equivalent to that of the Slovenes; their faces are longer and wider, however, their noses longer, and nasal concavity is reduced to 15 per cent of the whole.

The Serbs, who live for the most part to the north and east of the main Dinaric Alpine chain, and immediately east of the Bosnians and Montenegrins, founded a kingdom, after their invasion from the north in the seventh century, in the country drained by the headwaters of the Lim and White Drin rivers, in what is now the Ipek region of eastern Montenegro, and the Mitrovitza country.[120] The previous occupants were Romanized, Latin-speaking descendants of Illyrians and Thracians, and of colonists from other parts of the Roman Empire planted there by the emperors. During the twelfth century the Serbs expanded southward onto the plain of Kossovo, whence they made further conquests. Old Serbia, which arose as an important kingdom during the thirteenth and fourteenth centuries, had as its centers Skoplje and Prizren, which, for the last five centuries, have been mostly inhabited by Turks and Albanians.

[119] Biasutti, R., **APA**, vol. 51, 1921, pp. 154–184.
Hrdlička, A., *The Old Americans*.
Weisbach, A., **MAGW**, vol. 35, 1905, pp. 99–117.
[120] Anonymous, **MAGW**, vol. 18, 1888, pp. 182–190.
Cvijić, J., **GR**, vol. 5, 1918, pp. 345–361.

The Serbs expanded, during the period of their efflorescence, into Albania, Macedonia, and Thessaly; the arrival of the Ottoman Turks, however, in the latter part of the fourteenth century, terminated this period of expansion, and many of the Serbs fled northward, while others became Turkicized and Albanized. The Albanians, many of whom were converted to Islam, worked with the Turks rather than against them, and after the flight of the Serbs from the plain of Kossovo, this region was soon colonized by Albanians, many of whom still remain there. The once important Serbian influence in Albania has left few vestiges, other than Slavic place names, and the presence of a few islands of Moslem Serb speakers in the mountains, as in the Gora district of Luma.

In studying the racial history of the Balkans, it must be borne in mind that here more than elsewhere in Europe, linguistic and ethnic boundaries are constantly changing; there have been many wholesale emigrations and immigrations; whole countrysides have changed not only masters, but also peasantry, in mass evictions and mass colonizations. The Balkan peoples change their languages and ethnic identities with difficulty and only after bitter oppression; it is easier to transplant than to alter them; once converted, however, they become as ardent partisans of the new allegiance as of the old. The Serbs have been subjected to these disturbances as much as have the others. Their position as the dominant people of Yugoslavia has only been won through centuries of retrenchment and struggle; their present effort to Slavicize by force the minorities within their boundaries is a commonplace of Balkan history.

The modern Serbs, like the rest of the Yugoslavs, fall more into the Dinaric racial classification than any other.[121] Not as tall as the inhabitants of the mountain chain itself, they attain a national stature mean of about 168 cm., which varies somewhat regionally, reaching the figure of 170 cm. and over as one approaches Bosnia and Montenegro. The bodily build of the Serbs, as with most other southern Slavic peoples, is neither thick-set nor lean as a rule, but of moderate European proportions. A relative sitting height mean of 52.8 and a relative span of 102, emphasize the relative length of leg and shortness of arm. These are the proportions that one finds in southern Germany, rather than in northern Slavic countries.

The Serbs, for their stature, have, even more than the Slovenes, relatively small heads. The mean length is only 182 mm., the breadth 184.5

[121] Lebzelter, V., **MAGW,** vol. 59, 1929, pp. 61–126; vol. 63, 1933, pp. 233–251.
Maleš, B., *Antropoloska Ispitivanja.*
Maleš, B., and Konstantinovic, B., **RDAR,** vol. 28, 1928–29, pp. 401–416.
Pittard, E., **REAP,** vol. 20, 1910, pp. 307–311.
Wiazemsky, Prince, **Anth,** vol. 20, 1909, pp. 353–372.
Wrzosek, A., **WAnt,** vol. 1, Z.1, 1922.

mm., while the auricular height mean is only 123 mm. These are smaller than the heads of most Alpines, and of most western Dinaric groups. The cephalic index mean of 85 is of fully Dinaric elevation. The faces are also small, but longer than those of Slovenes and Croats, with a mean menton-nasion height of 122 mm. The bizygomatic breadth is likewise restricted, the mean of 140 mm. or less is no greater than among Nordics and Neo-Danubians. The noses are moderately leptorrhine (N. I. = 63), and small, (53 mm. × 33 mm.). The nasal profiles are usually straight, with a 25 per cent convex minority, and about 12 per cent of concave. The nasal root is almost always high, and the tip is inclined horizontally in most cases, but downward more frequently than upward.

The Serbs are darker in pigmentation than either the Slovenes or the Croatians; 45 per cent of eyes are pure brown (Martin #2–4), as against 20 per cent which are pure or nearly pure light. Over 55 per cent have black or dark brown hair, while light browns and blonds come to less than 10 per cent. The beards are, of course, often lighter than the head hair. The skin is brunet-white or light-brown in at least a third of the total. It is unlikely that the prevalence of brunet pigmentation among the Serbs came from a Slavic source, and as we shall presently see, the high incidence of dark eyes can hardly be called Dinaric. By elimination we must suppose that the Serbs, in their sojourn in northern Macedonia, accumulated a strong brunet tendency.

Bosnia consists of the six provinces, Bihać, Banjaluka, Tuzla, Travnik, Sarajevo, and Mostar, which lie between western Croatia, Dalmatia, Montenegro, and the Slavonian plain. The southernmost province, Mostar, includes the territory known as Herzegovina, which lies nearest to Montenegro. The Bosnians serve racially as an approach to the nucleus of Dinaric giantism in Montenegro.[122] Tuzla, in the northeast, has a mean stature of 171 cm.; Bihać and Banjaluca, in the northwest, of 172 cm.; in Travnik and parts of Mostar it rises to 173 cm., in Sarajevo to 174 cm., and in Herzegovina to 175–176 cm., approaching the Montenegrin level. The mean cephalic index of the Bosnians is over 85; this varies by religions, with the Catholics the most brachycephalic (86), and the Moslems the least (84). The Catholics are likewise the tallest and the lightest skinned; being the oldest population in the region in point of conversion, and the least affected by outside influences, the Catholic element preserves both a pre-Slavic[123] and a pre-Turkish racial configuration more completely than do the partisans of Orthodoxy or Islam.

[122] Capus, G., **BSAP**, ser. 4, vol. 6, 1895, pp. 99–103.
Krauss, F. S., **MAGW**, vol. 15, 1885, pp. 84–87.
Weisbach, A., **MAGW**, vol. 25, 1895, pp. 206–239; **MAGW**, supplement 2, 1889.

[123] Pre-Slavic in the chronological sense, not in the sense used by Polish anthropologists.

In hair and eye color the Bosnians are intermediate between Croatians and Serbs; they are darkest in the northeast, and fairest in the regions nearest Montenegro. Since they form but an extension of the Montenegrin nucleus, it will suffice here to point out their near identity with the inhabitants of that former kingdom, and to leave a detailed description for the latter.

On the steep and narrow coast of the Dinaric Alps, the zone of Dinaric racial concentration tapers off abruptly. The mean stature of the coastal people, from Istria along the Croatian shore and through the length of Dalmatia almost to the border of Albania, rises regularly from about 166 cm. to 171 cm., as one proceeds southeastward.[124] Although the head form, with a mean cephalic index of 83–84, remains brachycephalic, the extreme short-headedness of the mountain interior is not present. The pigmentation changes gradually but extensively from a prevailingly blond condition in Istria to a prevalence of dark-mixed and dark eyes, and of black or dark brown hair, in southeastern Dalmatia. One may attribute the lesser Dinaricism of the Dalmatians to Italian or to Vlach blood, or to both,[125] but this cannot be the only explanation. Dalmatia is the home, in solution, of a strong Atlanto-Mediterranean strain comparable to that found in northern Italy, which must go back in both places to a considerable antiquity.

The Montenegrins, who are the tallest people in Europe, live on a barren limestone mountain upland, where they, for centuries, succeeded in maintaining their Christianity and their freedom while surrounded by the Turks. They, like the northern Albanians, preserve their old exogamous clan organization, and their clan loyalties and feuds. They are linguistically Serbs, but there can be no question that they are to a large extent Slavicized Albanians; the cultural continuity between the two peoples is striking, the only real differences being those of language and religion. Although the Montenegrins are divided geographically into several sections, the racial differences between these are not great, and for the present purpose the Montenegrins will be dealt with as a whole. Where there are regional differences, the Old Montenegrins, who show the most extreme development in typically Montenegrin characters, will be referred to.[126]

[124] Weisbach, A., **ZFE**, supplement to vol. 16, 1884, pp. 1–77.
Zampa, R., **RDAP**, ser. 3, vol. 1, 1886, pp. 625–648.

[125] See Chapter XII, section 16, p. 614.

[126] The data upon which the following anthropometric summary is largely based consists of an unpublished series of over 800 Montenegrins measured by Mr. Robert W. Ehrich, and used here with his permission. Other sources consulted are:
Haberlandt, A., and Lebzelter, V., **AFA**, vol. 45, 1919, pp. 123–154.
Maleš, B., **AnthPr**, vol. 9, 1931, pp. 125–145.
Pittard, E., **RDAP**, vol. 26, 1916, pp. 199–201.
Valšik, J., **PAn**, vol. 8, 1934, pp. 53–55.
Vram, U., **ASRA**, vol. 11, 1905, pp. 183–193.

The mean stature of adult male Montenegrins reaches the figure of 177 cm., and in some districts it rises to 178 cm. The mean weight of a large series whose average age is 40 years is 160 lbs.; hence they are probably the heaviest as well as the tallest people in Europe, being even heavier than the Irish. Although their legs are very long, their trunks are correspondingly high, and a mean relative sitting height of 52 is at least 4 points higher than that for the long-legged Tuareg, who are the only white people of pure Mediterranean origin to approach them in stature. The Montenegrins' mean shoulder breath is 39 cm., and their chests are correspondingly large. The relative span of 101 is extremely low, indicating that their arms are short in proportion to either leg or trunk length. The hands and feet are, as is to be expected, usually of great size. These huge mountaineers are not as a rule slender, leptosome people; they are often thick-set, and are large all over.

As is to be expected among men of their stature and bulk, the Montenegrins have large heads, but these are not quite as large as those of the somewhat shorter Irish, Icelanders, or Fehmarners. The mean head length is 188 mm., the breadth 160 mm., the auricular height about 128 mm. The cephalic index mean is 85, about the same as for Croatians, Bosnians, and Serbs. The head length, however, is at least 7 mm. greater than that for these other Yugoslavs, excepting the Bosnians, who fill an intermediate position; the head breadth is about 6 mm. greater. The faces are correspondingly large; the minimum frontal mean is 112 mm., the bizygomatic 147 mm., and the bigonial 112 mm. The toal face height, 127 mm. in Old Montenegro, rises to a mean of over 130 mm. in Brda and the northern border tribes; the nose height reaches the remarkable elevation of 61 mm., while the breadth is 36 mm.

The facial index, in view of the great size of both component diameters, lies at 89 in Old Montenegro, on the border between mesoprosopy and leptoprosopy; it rises to 91 in Brda and the northern border tribes. The upper facial index, 53 in Old Montenegro, has a mean of 55 in the north. The nasal index is hyperleptorrhine, with tribal means ranging between 58 and 60. The widest faces, the shortest faces, and the lowest upper facial indices, as well as the widest foreheads and jaws, are concentrated in the southwest, Old Montenegro. These excesses are not typically Dinaric; they suggest only one possible relationship, and that is with the unreduced Upper Palaeolithic races.

The Montenegrins are prevailingly dark brown in head hair color; in Old Montenegro some 45 per cent of adult males belong to this class, while 20 per cent are medium brown, and 26 per cent auburn, or brown with a perceptible reddish tinge. The tribesmen of Brda and the northern border are somewhat darker, and show less rufosity. The beards are

much lighter than the head hair; among Old Montenegrins 43 per cent are reddish brown, and 8 per cent contain a pure red element; only 17 per cent are dark brown. In Brda golden-brown beards are extremely common, as frequent as 39 per cent; in the northern border tribes, 24 per cent. The rufosity of the Montenegrins, and their tendency to golden blondism, is not only extreme, but is particularly unusual for this part of Europe. It will be recalled that the Serbians, traditionally close relatives of the Montenegrins, are much darker haired, and that the Slavs in general, when blond, favor the ash-blond side of the scale, being almost entirely deficient in rufosity.

Twenty-five per cent of Old Montenegrins have pure dark eyes, and 10 per cent pure light ones. The pure darks are almost all mixtures between dark brown and light brown shades, while the pure lights are grayish blue. The mixed class, by far the largest, consists of 37 per cent green-brown, 20 per cent blue-brown, and 6 per cent gray-brown. The northern border tribes and Brda are lighter eyed than Old Montenegro, with only 20 per cent of pure darks. On the whole the Montenegrins have lighter eyes than the Serbs, and fully as light as the Slovenes and Croatians. Over 80 per cent have pinkish white unexposed skin color, ranging from von Luschan #3 to 7, 8, and 9; a small minority have skins which are as dark as light brown. About 25 per cent show some freckling, as is to be expected in association with rufosity.

The head hair is straight or nearly straight among half the Old Montenegrins, wavy among the rest; in the other tribes the ratio of straight runs higher. The beard and body hair are, as a rule, moderate to abundant; the glabrosity of the eastern Slavs rarely appears here. Baldness, either partial or involving the whole crown of the head, is quite common. The eyebrows are as a rule thick, and concurrent in 80 per cent of the group. Exceptionally heavy browridges, rare among other Slavs, are found in about 20 per cent. The eyes are frequently deep set, with a narrow opening between the lids; three men out of four have external eyefolds. A low orbit, a quite un-Dinaric character, seems frequent.

The nose again in many cases diverges from a Dinaric standard; deep nasion depressions are common, and the nasal root is often of only moderate height and moderate breadth. The bridge is frequently but by no means always high, and of medium breadth. Among the Old Montenegrins, non-Dinaric nasal characters are commoner than among the other tribal groups. Fifty-two per cent of convex nasal profiles, however, retain the Old Montenegrins as a whole in the Dinaric class; the ratio is higher elsewhere. Fifteen per cent are concave, and 4 per cent definitely snubbed. The tip is of medium thickness in most cases, and inclined downward more frequently than upward. It must be remembered that in this case we are

dealing with a series of men whose mean age is 40 years, and that among Dinaric peoples the depression of the nasal tip is a phenomenon of advancing age. On the whole the Montenegrins show a variety of nasal forms; the large hawk-beak for which they are famous is the most common, but alongside it is a large-tipped, low-bridged form which is less frequent but even more characteristic.

The lips are usually of moderate integumental and slight membranous thickness; eversion is usually slight, and this last feature may be associated with a 25 per cent incidence of the primitive edge-to-edge manner of dental occlusion. Although the malars are rarely prominent in the forward plane, the zygomatic arches frequently jut widely to the side; the gonial angles are of exaggerated prominence in nearly half the group. In the back of the head, occipital protrusion is usually slight to absent; occipital flattening is present in 43 per cent of the Old Montenegrins, and even commoner in some of the other groups. Lambdoidal flattening is even more frequent; few heads show no flattening in either the lambdoid region or below it.

The Montenegrins, after a detailed examination, are seen to be far from typical Dinarics in many features; they are too large-bodied, too large-headed, and too broad-faced; their noses are too frequently broad and thick-tipped. They are also far too rufous for the ordinary Dinaric type. Taking the Montenegrins individually, one finds many who do conform to standard Dinaric specifications, but are all taller than most Dinarics elsewhere; there are also some short, thick-set Alpines, and a minority of tall, brunet dolichocephals or near dolichocephals whom we shall also find farther south in Albania. But the Montenegrin of distinctive type, concentrated in Old Montenegro, is a very tall, large-bodied man, with a large, full-vaulted head abbreviated at the rear; his face is very broad, his jaw heavy, his brows overhanging, and his nose large and thick-tipped. It is this type which bears the rufosity in hair color, the freckling, and a tendency to light-mixed eye color. Most of the Montenegrins are intermediate between this type and a more conventional Dinaric.

The Old Montenegrin type, concentrated in the southwestern mountain fringe of Montenegro, just north of the Lake of Scutari, in the most conservative part of the kingdom culturally, and the ethnic center of the Montenegrin nation, is nothing more nor less than a local unreduced brachycephalized Upper Palaeolithic survival or reëmergence, comparable to those found in northern Europe and northern Africa. Its growth to an extreme size is a local specialization, in which selection may have played a part, as well possibly as nutritive factors associated with life on a limestone mountain. Mixture with this Borreby-like type, and a response to the same selective and environmental influences, have elevated the stature

of the accompanying Dinaric factor as well. Montenegro is not, therefore, simply a Dinaric nucleus; it is a Borreby-like or Afalou-like outcropping within a Dinaric nucleus. We know little or nothing of the prehistoric archaeology of Montenegro. So far there is no evidence to prove or disprove the presence of an Upper Palaeolithic European racial strain in this region. How this strain got to Montenegro, far from its other centers of survival, is a problem which cannot be solved without further facts.

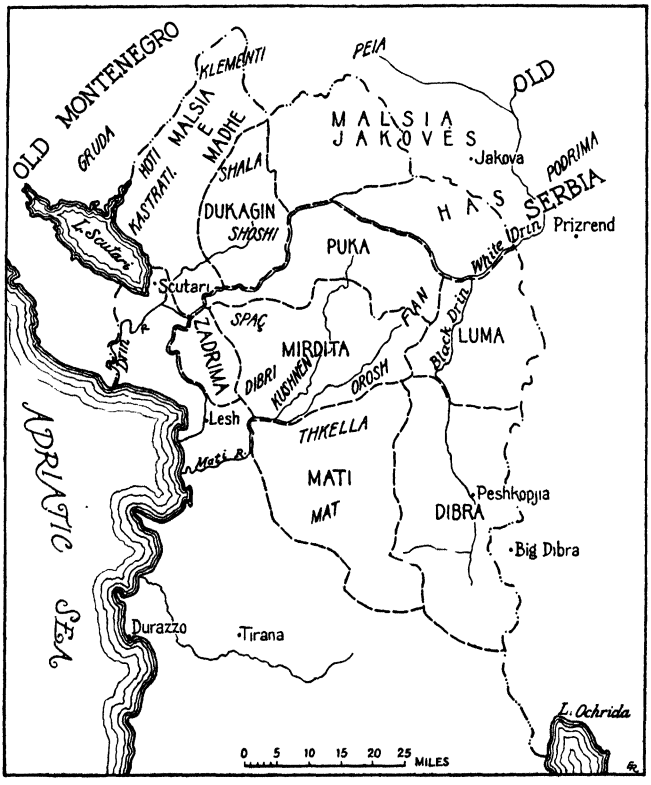
(13) ALBANIA AND THE DINARIC RACE

The kingdom of Albania, lying directly south of Montenegro, contains a population of roughly one million people; another million at least live outside the borders of their own country, mostly in Yugoslavia, although there are large colonies in Greece and in Rumania, as well as in the United States. They are divided into two distinct ethnic groups, each with its own variety and dialects of the Albanian language, its own costume, and its own particular pattern of culture. These are the Toscs in the south, and in the north and on the plain of Kossovo, the Ghegs. The Ghegs still preserve their system of exogamous patrilineal clans, comparable to that of the Montenegrins; they are divided into ten tribes of which at least part of each lies in Albania itself, and three or perhaps more outside. The ten in Albania include Malsia ë Madhë, Dukagin, Malsia Jakovës and Has, all north of the Drin, and reading from west to east. Both Has and Malsia Jakovës extend eastward into Old Serbia, north of Prizren; Malsia ë Madhë has clans in Old Montenegro. Entirely outside of Albania, in Montenegro and the Kossovo country, are Peia, Podrima, and a number of clans in the neighborhood of Mitrovitza. South of the Drin are Zadrima, immediately southeast of Shkodra; Puka, Mirdita, and Luma, part of which is Serbian-speaking; south of this band are Mati, the tribe of King Zog, and Dibra, which occupies the slopes on either side of the Black Drin.

Seventy per cent of the Albanians in Albania are Moslems, nearly all in Yugoslavia are. The remaining 30 per cent are equally divided between Catholics and Greek Orthodox. The Catholics are all Ghegs, the Orthodox all Toscs. Of the Ghegs, all of Mirdita, all of Dukagin, and parts of Zadrima, Malsia ë Madhë, Puka, Malsia Jakovës, Has, and Mati are Catholic. The Catholics are the most conservative culturally, and as a rule the most remote in their habitat. Neither Catholicism nor Islam have inhibited the functioning of the Gheg social system, which operates in an unusual manner. Each tribe is divided into geographical and political divisions known as *bairaks*, but independent of this is another concept known as the *fis*. The *fis* is an exogamous patrilineal kinship group, without geographical attachment; several whole *bairaks* may belong to

one *fis*, and thus be excluded from intermarriage; on the other hand one small village may contain branches of several *fis*, some large and national, other small and local.

The *fis* is the body of descendants in the male line of one usually eponymous ancestor. In various tribes different rules hold as to the determination of when this relationship may become so remote that the marriage



MAP 15

TRIBAL DIVISIONS IN NORTHERN ALBANIA

restriction breaks down; in some, after one hundred generations; in others, only when the exact relationship is unknown. This exogamy has a close bearing upon the regional physical anthropology of the Ghegs, since it oversteps tribal boundaries and causes a trading of wives over large distances. Designed to prevent incest, it actually produces close in-breeding, since reciprocal matings amount in many cases to habitual cross-cousin marriage.

The most important *fis* is that to which the people of the famous *bairaks* of Shoshi and Shala, in Dukagin, belong, and also three of the five *bairaks*

of Mirdita. The restrictions against intermarriage between Shoshi and Shala have broken down, as well even as unions between moieties within these *bairaks*, but in Mirdita all the young men of the three *bairaks* of Spaç, Orosh, and Kushnein must take their wives from the other two, Dibri and Fan. The original ancestors of this super-*fis* were brothers, who came from the plain of Kossovo into the mountains looking for refuge, at least 100 generations ago, according to the popular tradition. That many such movements must have taken place in the past is apparent; northern Albania is a refuge area of the first water. The Albanian language, a hybrid between Illyrian, Thracian, Latin, Slavic, Turkish, and other elements, reflects the ethnically composite origin of the Albanians.

The stature of the Ghegs is extremely variable geographically; the tribes which touch Montenegro have means of 173 cm. and 174 cm.; the northernmost *bairaks* of Malsia ë Madhë and Dukagin, which lie closest to Old Montenegro, are taller than the southern ones within their own tribes.[127] On the south side of the Drin the means fall to 169 cm., and continues to the level of 167 cm. in Mati and Mirdita. The stature level of the Montenegrins tapers off much more rapidly to the south of its nucleus than it does to the north. The descent in stature level is steepest on the western side of the mountains; on the eastern side, from Has to Dibra, there is a drop of only 2 cm. The stature of the Albanians is chronologically constant; there is no internal evidence of recent increase.

The relative span of the Ghegs is 104, higher than that of Montenegrins, and more in accordance with Dinaric standards. The relative sitting height of 52.8 is much the same, and shows no regional differences of any importance. As in Montenegro, bodily build is not controlled by stature; the most thick-set individuals are often the tallest. The shoulder breadth-stature ratio is in fact highest in the tribes adjoining Montenegro.

The mean cephalic index of the Ghegs is 85, as with most Dinarics. Geographically, however, the highest indices are found in the west, in Malsia Jakovës, Zadrima, and Mati, the three tribes situated on the coastal side of the mountain chain; here the means lie between 86.5 and 87. A zone of relative long-headedness is found in the east, in Malsia Jakovës and Luma, where the means are 83. Thus the progression is from west to east, and not north to south, as with stature.

[127] This section is based upon a series of 1100 Ghegs measured by the author in 1929–30. In each of the ten tribes within Albania, the sample includes over 100 men; within each tribe the *bairak* and village distribution is approximately even. Other sources dealing with the Ghegs include:

Haberlandt, A., and Lebzelter, V., **AFA**, vol. 45, 1919, pp. 123–142.

Pittard, E., *Les Peuples des Balkans.*

Tildesley, M. L., **Biometrika**, vol. 25, 1933, pp. 21–51.

Weninger, J., *Rassenkundliche Untersuchungen an Albanern*, **RPN**, ser. A. vol. 4, 1934.

As one would expect, the head dimensions vary with stature; the mean head lengths in the north range from 186 mm. to 190 mm.; in the south from 183 mm. to 185 mm. The head breadths run from 162 mm. in Malsia ë Madhë to 165 mm. in Luma. The widest heads are thus found in proximity to Old Montenegro. The vaults of the Ghegs are moderately high; ranging from 129 mm. in the north, to 126 mm. in the south. The facial diameters show both a north-south and an east-west progression; the minimum frontal mean, for example, is 112 mm. in Malsia ë Madhë, and 110 mm. in other tribes north of the Drin; elsewhere it falls to 107 mm. and 108 mm. The bizygomatic, with a mean of 144 mm. in the northwestern tribes, falls regularly to 140–141 mm. in the south and east. The bigonial follows a similar progression from 109 mm. to 107 mm. In these facial diameters, as in stature, the northwesternmost Ghegs form a continuation of the oversized racial area of Old Montenegro; elsewhere there is a rapid tapering to a normal Dinaric condition. It is to be noted that among these Dinarics, patently the descendants of pre-Germanic and pre-Slavic mountain peoples, the forehead is wider than the mandible, and the face takes on the characteristic form of an inverted triangle.

Once outside the Montenegrin area, the face loses its excessive height; the mean menton-nasion diameter of the Ghegs is 124 mm., comparable to face heights in southern Germany and Switzerland. The greatest heights, reaching a mean of 126 mm. in Has, are found in the east, along the edges of the plain of Kossovo; the shortest, reaching 121 mm. in Mirdita, are located in the central mountain nucleus, from Dukagin to Mati. This regional pattern is clearly shown by the facial index, which runs from 86 in the center and west, to 89 in the east. All tribes but Has, however, are mesoprosopic. The upper facial index is even more variable; the mean for Mirdita is 49; for Has 54; this range is nearly as great as that for all of Europe. The noses of the Ghegs, 58 mm. high by 34 mm. wide, are among the world's most leptorrhine, with a mean nasal index of 58.

Metrically the Gheg tribes present a complex situation; the rapid progression from north to south in stature and in the breadths of the head and face show that the Borreby-like nucleus of Old Montenegro does not extend far southward into Albania. The tall, northern tribesmen are the most heavily built, the shorter southern ones the most sparely; a conventional Dinaric build goes with the shorter stature level. In the eastern tribes there is strong evidence of a moderately tall, long-faced, dolichocephalic element; while a short-faced element, metrically suggestive of Alpines, is centered in the very remote mountain valleys of Mirdita.

Almost all of the Ghegs are light-skinned, with the von Luschan #3 and 7 most frequently represented. Freckling, common in Montenegro,

is rare here; what little there is is confined almost entirely to the tribes nearest Old Montenegro, and here it reaches but 5 per cent. The head hair is usually brunet, with black or near black reaching 40 per cent, and dark to medium brown 45 per cent. Light brown or blond hair, which is almost always on the golden or slightly rufous side, accounts for the other 15 per cent. Only two men out of 1100 were found to have ash-blond hair. As in Montenegro, the beards are much lighter than the head hair; the black contingent is reduced to 6 per cent, while 36 per cent are reddish brown or auburn, 3 per cent red, and 30 per cent golden blond or light brown with a golden tinge. The rufous tendency, while not as pronounced as in parts of Montenegro, exists to the virtual exclusion of ash-blondism. Regionally, the darkest hair is found in Mirdita and in the eastern border; the lightest in the west and south.

Seventeen per cent of Ghegs have pure brown eyes, and 7 per cent pure light ones. Half the group has green-brown iris combinations and 20 per cent blue-brown. Of the mixed eyes, 30 per cent are dark-mixed, and 48 per cent predominantly light, the rest nearly even. The Ghegs are, therefore, thoroughly mixed, or almost completely intermediate, in eye color, with the blond element or elements slightly more important than the brunet. The darkest eyes are found in Dukagin, and in Malsia Jakovës, on the border of Old Serbia; there 25 per cent of eyes are brown. Elsewhere there is little regional differentiation.

The head hair of the Ghegs is usually wavy, and medium to fine in texture; it is of greater than average abundance for Europeans on mustache, cheek, jaw, and on the body; at the same time the correlative tendency to baldness is strong here. The eyebrows are usually thick, and are concurrent in 70 per cent of the group. As in Montenegro, the foreheads are seldom very sloping; the browridges are usually on the heavy side of medium. External eyefolds, found in 35 per cent of the group, are commonest in the tribes which form a continuation of the western mountain zone south of Old Montenegro; elsewhere the high Dinaric orbit precludes their development in most cases.

The nasal morphology of the Ghegs is usually more strictly Dinaric than that of the Montenegrins; the root and bridge are more consistently elevated, and the tip as a rule thinner. Well over 50 per cent have convex profiles; only 6 per çent concave. Less than half the tips are inclined downward; only in Malsia ë Madhë, closest to Montenegro, are depressed tips in the majority. With the thin nasal tip goes a high ratio of compressed nasal wings; the Gheg nose is truly leptorrhine morphologically as well as metrically.

The faces of the Ghegs often lack the strong bony relief so noticeable among Montenegrins; the lateral jut of the zygomatic arches is usually

restricted, and the gonial angles are usually of but medium prominence. The cheeks are usually drawn and thin, and while this condition may be partly nutritional, it has its racial implications. The plump, fat-padded cheeks of the Ukrainian peasants stand at the opposite European extreme.

The morphology of the occipital region among the Ghegs, in view of their general Dinaric character, is of particular interest. The occipital protrusion is as a rule slight to medium; it is least in the western tribes, and greatest in the eastern. Actual occipital flattening is found in only 30 per cent of the group; tribal incidences range from 50 per cent in Malsia ë Madhë to 20 per cent in Dukagin, Malsia Jakovës, and Puka. On the whole the distribution is definitely west to east. Lambdoid flattening is found among 44 per cent of the Ghegs; it is thus more frequent than the occipital form. Its tribal distribution is exactly opposite to that of occipital flattening; the two phenomena are usually complementary, and a minority only of individuals lacks either.

There has been much discussion upon the subject of occipital flattening, both in Albania and in Asia Minor; there are two definite schools, one which believes that it is natural and racially determined, the other that it is a form of artificial deformation caused by cradling. My own position lies between these two extremes; [128] occipital flattening is without doubt a phenomenon associated with the entire mechanical orientation of the cranium in the Dinaric race, and especially with the position of the foramen magnum to the rear of that usual in most races. As such, it is undeniably inherited.

At the same time, the use of the Albanian cradle, in which the shoulders are bound but the head is not, may in some instances have caused an intensification of this flattening, since the heads of some living Albanians are unquestionably deformed. However, since cradling practices are regionally uniform in Albania, the geographical distribution of this character is wholly racial in pattern.

At this point there arises the entire question of Dinaric origins, which may be approached on the basis of a statistical analysis of the Gheg material. Attempts to intercorrelate metrical and morphological characters with each other and with pigmentation reveal the presence of the following types in Ghegnia, each of which shows a tendency for the characters of which it is composed to associate themselves as a unit.

(1) A tall, large-headed, brachycephalic, wide-faced type, with intermediate pigmentation, and an especial tendency toward rufosity. This is the Borreby-like type prevalent in Montenegro; in Albania it is almost wholly confined to the tribe of Malsia ë Madhë, and within that tribe is concentrated in the *bairak* of Gruda.

[128] A detailed study of this question will be published in the author's *The Physical Anthropology of Northern Albania.*

(2) A medium-statured, brachycephalic, short-faced type, with mixed pigmentation, which is fundamentally Alpine. It is found in all tribes, but is commonest in the refuge area of Mirdita.

(3) A tall, dolichocephalic or mesocephalic type with dark hair and dark brown eyes, a straight nasal profile, and a tendency toward a lesser leptorrhiny than the total group. This is an Atlanto-Mediterranean racial type which is also prevalent in other Balkan countries. It may also be sorted out of available statistical series of Greeks, while it is common in Bulgaria and easily distinguishable among Serbs. It, or a similar type, also occurs with Dinarics in northern Italy and the Tyrol. In northern Albania it is commonest in Malsia Jakovës and Dukagin.

(4) A very strongly differentiated type which is characterized by medium stature, exceptional brachycephaly, great narrowness and convexity of the nose, a high incidence of occipital flattening, and a tendency to light brown eye color in combination with dark brown hair. This type may be called Dinaric in the full or specific sense; most of the other Ghegs are Dinarics in a partial or a general sense. This ultra-Dinaric type is commonest in the tribe of Dibra.

(5) A blond, brachycephalic, convex-nosed Noric, of standard type. It is commonest in Zadrima.

(6) A few light brown-haired Nordics, centered in Luma.

As a result of the foregoing division of the Gheg material into natural sub-racial compartments, it becomes apparent that the Dinaric race, in the sense of a tall, convex-nosed, long-faced population inhabiting the mountain zone which stretches from Switzerland to Albania, is a composite aggregation of racial types. The specific nature of the Dinaric population of any given segment of this zone depends upon the local elements involved; thus there are regional Dinaric sub-types. There is one dominant set of characters which pervades the Dinaric group; high brachycephaly, nasal convexity, occipital flattening, and a tendency toward the attenuation of extremities. Aside from these features, the original ingredients in the Dinaric blend tend to retain their old linkages.

The peculiar facial and cranial features of the Dinarics seem to be the results of differential inheritance in hybridization; the primary mixture which brings them about is apparently an Alpine-Mediterranean cross, with Mediterranean used in the widest sense of the word. The Asiatic Dinarics, who appeared early in the Metal Age, were apparently Alpine-Cappadocian hybrids; many of those went to Europe and settled in widely separated places, including sections of the Dinaric Alps. The exaggerated Dinaric type of Albania, with its tendency to light brown eye color may

conceivably be derived from this source. It is also to be found in considerable numbers in the Tyrol.

All European Dinarics, however, cannot be traced to this Near Eastern origin; most of them must be the result of primary blendings on European soil. Here the two principal ingredients are the tall, dark brown-eyed Atlanto-Mediterranean which seems old and basic in southeastern Europe, and an ordinary Alpine. Nordic accretions produce a Noric, Borreby-like accretions an Old Montenegrin. Neo-Danubian Slavic additions produce the small-faced type common in Slovenia, Croatia, and Serbia.

The blending of the Dinarics is never perfect in a chemical sense; in any Dinaric population there are ordinary Alpines and a few Atlanto-Mediterraneans along with their blended brethren. When the proportions of the ingredients are wrong, the type which is present in excess may be found in some numbers in its original form. That is why there are so many Alpines in France and Switzerland, and so many Atlanto-Mediterraneans in Malsia Jakovës.

Dinaricism is not a quality pertaining to a single race, it is a condition. This condition is common in Europe; it is also common in western Asia. Furthermore, it is not confined to the white racial stock; the principle of hybrid inheritance which produces Dinarics in Europe has also produced Papuans in New Guinea, the Arii aristocrats in Polynesia, and many American Indians.

The southern half of Albania, the homeland of the Toscs, lies outside the Dinaric racial area in the strictest sense. The Toscs are dwellers in compact villages, wearers of pleated kilts like the Greeks, and frequent emigrants to other lands. Like the Mzabites in Algeria, and the Hadhramis of southern Arabia, many of the male inhabitants of several southern Albanian towns, notably Korça, migrate to distant lands in their youth, work in factories or run shops, and return when they have accumulated enough money. It was this system which first led Albanians to migrate to America, a system which the Toscs share with the Greeks.

The only adequate anthropometric data extant which deals with the Toscs is a series from southwestern Albania, from the town of Gjinokastër and its neighborhood.[129] These Aginocastrians are on the short side of medium in stature, with a mean of 164 cm.; they are long-bodied, with a mean relative sitting height of 53.7, and medium in arm extension (rel. span = 103.4). They are, as a rule, medium to lateral in bodily build. Their cephalic index mean, 90.8, is by far the highest recorded in Europe.

[129] Tildesley, M. L., **Biometrika,** vol. 25, 1933, pp. 21–51.

See also:

Pittard, E., *Les Peuples des Balkans*; **RA,** vol. 40, 1930, pp. 109–115 (for Toscs in Rumania);

Zampa, R., **RDAP,** ser. 3, vol. 1, pp. 625–648 (for Toscs in Italy).

Their head length, 177 mm., is extremely small, its breadth, 161 mm., great. The auricular height of 122 mm. is moderate to low. The forehead is rather broad, with a minimum frontal of 109 mm., the mandible less so, with a bigonial of 107 mm., while the face breadth, 141 mm., like the other facial dimensions, falls into the Alpine range. The face height, 119 mm., is moderately short; the facial index, 84.4, barely mesoprosopic. The nose, however, with a length of 56.3 mm. and a breadth of 34.4 mm., is very leptorrhine, in a typical Albanian manner, with a nasal index of 61.

Toscs measured in Rumania have a mean cephalic index of 87; members of the Tosc colonies of southern Italy, who fled across the Adriatic from the Turks in the sixteenth century, a mean of 80. It seems probable that the extreme index mean of the Gjinokastër neighborhood is higher than that for the Tosc country as a whole; yet individual Toscs measured in Massachusetts run well into the 90's. The Italian Toscs may owe their relative dolichocephaly to (a) mixture with Italians, (b) selection at source of migration, or (c) the possibility that the high brachycephaly of the Tosc country may be a recent phenomenon, as in southern Germany, Bohemia, and so many other central European countries. It is very possible that the high brachycephaly of the Toscs at home may be partly due to cradling; it is a commonplace in the Albanian colony of Massachusetts that the newer generation born in Stockbridge and Brockton lacks in many cases the extreme occipital brevity of its parents.

Further exposition concerning the physical anthropology of the Toscs must take the form of subjective observations and remarks, which are permissible only in lieu of adequate data. In the first place, the fundamental Tosc type is Alpine. The head form, with or without occipital flattening, is usually globular, the forehead high and often bulbous, the face frequently round in contour. The nose in many cases lacks the high-bridged Dinaric character found among the Ghegs, as well as the common depression of the tip. This Alpine type is well represented by photographs on Plate 14. Beside the Alpines, there are many Dinarics in southern Albania, but they probably form a minority, and in any case are extremely variable. In Albania it is very easy to distinguish a Gheg; they have a racial hall-mark which is hard to define and easy to recognize; the Toscs are much less homogeneous, and in America they pass for the most part unnoticed in the general racial hodge-podge. Most Bostonians, who possibly see fifty to one hundred Toscs in a week, are unaware of their presence, while they have definite ideas, formed upon first sight, as to who is an Italian, an Armenian, or a Jew.

It is my opinion that the Toscs, in pigmentation as well as in bodily and facial characters, resemble the southern and central French very

closely; that they and the French form the two ends of the Alpine racial area in Europe, the center of which is largely taken up by the Dinaric amalgam.

(14) THE GREEKS

The title of this section is *The Greeks*, and not *Greece*, since from the mythical days of the Argonauts to the present, neither the peninsula of Hellas nor Ionia and the Aegean Islands have been large enough to hold the far-wandering Hellenes. Greek is a language and a civilization, the Greeks a people; the Greeks are the descendants of all the peoples who have adopted and retained that language and that civilization from classical times to the present. Some of these converts to Hellenicism were inhabitants of Asia Minor, others of Thrace and Byzantium, others of the lands bordering the Black Sea, especially the Crimea.

Into the peninsula of Greece itself, many thousands of Slavs wandered as immigrants during the maximum South Slavic expansion; the Turks brought colonists, including many Albanians, and whole districts of Boeotia and Attica and of other parts of Greece are today Albanian speaking. Romance-speaking shepherds, the Vlachs, have also made the slopes of the Pindus their seasonal pastures. Since the World War many of the Greeks living in Thrace and Asia Minor have been sent to Greek soil to live, while Turks and other Moslems have been in turn repatriated. Despite these attempts at producing ethnic order, much Greek territory, especially in Macedonia, remains ethnically heterogeneous. Furthermore, the number of Greeks who live abroad, be it in Egypt, East Africa, or in the New World, is so great that the Greeks are still almost an international people. Many of the Greeks leave home to make their fortunes on less stony soil, but many of them also return.

It is inaccurate to say that the modern Greeks are different physically from the ancient Greeks; such a statement is based on an ignorance of the Greek ethnic character. In classical times the Greeks included many kinds of people living in different places, as they do today. If one refers to the inhabitants of Attica during the sixth century, or to the Spartans of Leonidas, then the changes in these localities have probably not been nearly as great as that between the Germans of Tacitus and the living South Germans, to cite but a single example.

Within the peninsula of Hellas, despite the mobility of the Greeks to and from their country, the internal mobility has not been sufficient to break down strong local differentiations in head form. The Epirotes, like their neighbors the Toscs, have an extremely high cephalic index mean, 88, and there seems to be a strongly brachycephalic zone running down the western slopes of the mountain core from Albania to the Gulf of Corinth,

and perhaps beyond.[130] It is an extension of the same zone which extends all the way from the Alpine racial center in France, and more specifically, of the population studied in the region of Gjinokastër in southernmost Albania. The Greeks of Macedonia, again, who live in settlements interspersed with those of Bulgars and of Turks, possess the usual West Balkan brachycephaly, with mean cephalic indices of 86 for Christians, and 84.6 for Moslems. Greeks from the northern shore of Asia Minor have a mean of 87, while those from the Black Sea coast in Rumania, and members of the colony in the Crimea, are low brachycephals, with a mean of 82.

In Greece itself, most of the Peloponnesus, Attica, Euboea, and the Ionian Isles are characterized by a mean cephalic index of 81 to 82; this is also true of the Greeks who are found abroad, as in America. Aside from local groups in regions which, in classical times, were not truly Greece, the modern Greeks are for the most part low brachycephals. In Thessaly a provincial mean of 77 has been reported; and Greeks from the shore of the Sea of Marmora have a mean of 79. There are still, therefore, local groups of Greeks who are largely long-headed.

The stature mean for Greeks in general runs about 167 cm., and there seems to be little regional variation; those in Asia Minor and in the Crimea are a millimeter shorter, those measured in Boston a millimeter taller. The Greeks are as tall as most South Germans or northern Frenchmen; their stature is too elevated for the prevalence, in partial brachycephalization, of a strong, small Mediterranean strain. About half of them have brunet-white or light brown skin color, the rest the usual pinkish-white of central and northern Europe; over 80 per cent have dark brown hair, the rest have hair evenly divided between black and the lighter shades of brown. Pronounced blondism, although rare, is not unknown. The beard is rarely lighter than the head hair, in contrast to the condition found among Ghegs and Montenegrins; the implication is that the dark brown

[130] A bibliography of works on the physical anthropology of the modern Greeks would include:

Apostolidès, **BSAP,** ser. 3, vol. 6, 1883, pp. 614–616.
Cučukala, G. J., **AnthPr,** vol. 8, 1930, pp. 12–136.
Hasluck, M. M., and Morant, G. M., **Biometrika,** vol. 21, 1929, pp. 325–334.
Hrdlička, A., *The Old Americans.*
Koumaris, J., **ACAP,** 1931. Paris, 1931, pp. 218–221.
Neophytos, A. G., **Anth,** vol. 1, 1890, pp. 679–711; vol. 2, 1891, pp. 25–35.
Ornstein, **ZFE,** vol. 9, 1877, pp. (39)–(41); vol. 11, 1879, pp. (305)–(306).
Pittard, E., **ASAG,** vol. 1, 1914, pp. 7–36; **RDAP,** vol. 25, 1915, pp. 447–454.
Schiff, F., **ZFE,** vol. 46, 1914, pp. 14–40.
Stephanos, C., **DESM,** ser. 4, 10, 1884, Article *Grèce,* p. 432.
Weisbach, A., **MAGW,** vol. 11, 1882, pp. 72–97.

Besides these published works reference has been made to a series of 113 Greeks measured in Boston in 1932, by Drs. B. Gardner, S. Kimball, M. Titiev, and Mr. E. Muller, as part of a graduate course in field methods, under the direction of the author.

hair of the majority of Greeks is a pure brunet condition. Over 65 per cent of Greeks have pure brown eyes, and most of these are dark brown; pure lights are sporadic, but there is a 15 per cent incidence of light-mixed iris forms.

The pigment ratios given above apply to Greeks as a whole; there is evidence, however, of considerable regional variation. The Macedonian Greeks are much lighter, especially those that are Moslem, while the Greeks of the Ionian islands are darker, as are, in all probability, most Peloponnesians.

For a more detailed study of the Greeks, we may examine the series measured in Boston, which, although without doubt subjected to selective forces, does not seem too much at variance from native Greek samples for our purposes. The men measured came from all parts of Greece, and from Asia Minor. Their mean stature, 168 cm., is moderately tall; their bodily proportions are for the most part intermediate; the shoulders are broad, the trunk length moderate, as shown by a relative sitting height of 52.9; the relative span is 104.

Their heads, with a mean cephalic index of 82, are long for brachycephals (189 mm.), and of moderate breadth (154 mm.); the head height of 127 mm. is moderately high. The occiput protrudes but little in most of the group; 40 per cent have lambdoidal flattening, while some degree of occipital flattening occurs in over 50 per cent. It is pronounced, however, in only about 20 per cent. Their facial breadths are: minimum frontal, 107 mm., bizygomatic, 142 mm., and bigonial, 111 mm.; the great breadth of the jaw, as compared with that of the forehead, is a Greek specialty, and is strongly contrasted with the inverted triangle face form of Albanian Dinarics. The face height is 124.4 mm., the upper face height 75.6 mm.; the facial index, 87, is mesoprosopic, the upper facial index, 53, a little high in comparison with the foregoing. The noses are both long (58.8 mm.) and moderately broad (37 mm.); the nasal index of 63.2, leptorrhine.

The dimensions given above are for the most part quite variable; a number of distinct types are included, but the metrical character of the group as a whole indicates a blending of Dinarics and Alpines with Atlanto-Mediterraneans, which is confirmed by the observational data to follow.

The head hair is straight in slightly more than half the group, wavy in most of the rest, but curly hair is not unusual. It is usually medium to fine in texture. With at least half of adult male Greeks, it is thin on the head, and about one out of five of any adult group is bald. In old age baldness affects the majority. The beard development is as a rule thicker than in most European groups, and the body hair is often abundant.

The eyebrows are often thick, and are concurrent in 75 per cent of the

group; the browridges are usually of moderate development. The foreheads give, in most cases, an appearance of great width, and are seldom more than very slightly sloping. The nasal characters of the Greeks are variable, but there are definite trends which pervade the whole group. The root is, as a rule, moderately high, and medium to broad; narrow roots, usual among most northern Europeans and among Dinarics, are rare. The bridge is of medium to great height, almost never low; the breadth is as a rule medium to broad. The nasal profile is straight in about 45 per cent of the group, convex in about 30 per cent, and concave in but 10 per cent, while the rest are wavy or concavo-convex. The tip is as a rule thick, and elevated more often than it is depressed. The nasal wings, as a rule medium, are flaring more often than compressed. On the whole few Greek noses can qualify as Dinaric in the strict sense; more are typically Alpine, while a straight-profiled, consistently wide form is the commonest.

There is nothing remarkable about the lips and mouth region of the Greeks; both membranous and integumental lips thicknesses are of usual European dimensions, and eversion is as a rule slight to medium. The lip seam, however, is usually visible, and is sometimes prominently elevated. A slight degree of facial prognathism is found in nearly half the group; alveolar prognathism is rare. Typically Greek features are full, curved temples, full cheeks, a laterally prominent malar region, and strongly everted gonial angles. In these facial characters well over half show an extreme development for Europeans.

Within the Greek group, heavy beards, heavy browridges, and concurrent eyebrows tend to associate themselves with an Alpine type; there is also a linkage between tall stature, in the 170 cm. class, cephalic indices of about 80, straight noses, dark brown hair, and dark brown eyes. This last set of associations clearly denotes the presence of a strong Atlanto-Mediterranean element. There are also strong connections between black hair, occipital flattening, and narrow facial features, which means Dinaric or Armenoid. That the small amount of blondism among the Greeks is mostly Nordic in origin is indicated by its linkage with external eyefolds, relative thinness of beard, and absence of eyebrow concurrency.

The Greeks, in short, are a blend of racial types, of which two are most important; the Atlanto-Mediterranean and the Alpine. Dinaricism here is present, but not all pervading; true Alpines are commoner than complete Dinarics. The Nordic element is weak, as it probably has been since the days of Homer. The racial type to which Socrates belonged is today the most important, while the Atlanto-Mediterranean, prominent in Greece since the Bronze Age, is still a major factor. It is my personal reaction to the living Greeks that their continuity with their ancestors of the ancient world is remarkable, rather than the opposite.

The living inhabitants of Crete differ considerably from the mainland Greeks.[131] They are taller, with a mean stature of 169 cm., and mesocephalic, with a mean cephalic index of 79. In some districts, as at Pedhiádha, the mean is actually on the upper border of dolichocephaly, at 77. The heads of the mesocephalic Cretans are as large as those of Nordics or Atlanto-Mediterraneans; a mean length of 193 mm., and a breadth of 149 mm., characterizes the group with an index mean of 77.

In facial and nasal dimensions, the Cretans resemble the Greeks. They are, however, somewhat blonder; only 35 per cent have pure brown eyes, while about 7 per cent have eyes that are light or predominantly light; the rest are mixed, with dark mixture in the great majority. About 25 per cent have black hair, and about 50 per cent dark brown; 10 per cent are light brown or blond, the rest medium brown. As among Albanians and not among most mainland Greeks, the beards are much lighter; 40 per cent have blond or light brown mustaches, with an equal number black or dark brown. About one-sixth have light brown to very brunet-white skin color.

One special group, the Sphakiots, living near the western end of the south side of the island, differ from the other Cretans in a number of characters; they are very tall, with a mean stature of 175 cm., and meso- to sub-brachycephalic, with a mean cephalic index of 81.6. They have especially large heads, with a mean length of 191 mm. and breadth of 155 mm.; their faces are longer than the others, and equally broad or broader. Morphologically Dinaric types are common among them; they may be compared with Montenegrins and the northernmost Ghegs. According to the general assumption of authorities on Crete, the Sphakiots are the partial descendants of the Dorians who invaded the island at the end of the Minoan period. That some of them do resemble the traditional Spartan type is very likely. One can only derive them from the north, from the region in which the larger branch of the Dinaric race was formed.

The living Cretans are for the most part Atlanto-Mediterraneans, and there has been no post-Dorian migration into the island which could have brought such a type in large numbers. The only logical explanation of its presence in Crete, formed on the basis of available data, is that some of this element existed in Crete in Minoan, probably for the most part Middle and Late Minoan, times; that migrations from the Greek mainland at the time of the Minoan collapse may have brought more.

The fact that a larger number of Cretans are blond than is the case with

[131] Hawes, C. H., **ARBS**, vol. 14, 1909–10, pp. 258–280; **RBAA**, supplement, 1910.
Luschan, F. von, **ZFE**, vol. 45, 1913, pp. 21–393.
Rosinski, B., **Kosmos**, vol. 50, 1925, pp. 584–637.
Schiff, F., **ZFE**, vol. 46, 1914, pp. 8–13.

Greeks is a matter that requires ample data and some analysis to explain. One may attribute much of the blondism, perhaps, to the invasion that brought the Sphakiots, while some of it must be inherent in the Atlanto-Mediterranean race. But the arrival of the early Greek-speakers may have brought blondism other than that borne by the brachycephals, and Crete is an island; it is a principle of insular anthropology, well borne out by the British Isles, that when a numerous group invades an island it has a better chance for survival than in a continental area where there is a nearby mountainous or forest-covered hinterland, to which earlier types may retreat and from which they may reëmerge.

The important discovery about Crete, however, is the fact that its population is mostly Atlanto-Mediterranean; this race seems to be almost equally important in most of Greece. It has also appeared in the Dinaric area, and in Serbia; we shall see more of it in the eastern Balkans.

(15) BULGARIA

East of the Illyrians and north of the Macedonians lived, in classical times, the Thracians. Their territory reached beyond the Danube on the north to the border of Scythian country, and on the east to the Black Sea. In the period of their greatest power, between 450 and 300 B.C., they were a numerous and important people; Herodotus called them the most numerous west of India. The southern Thracians were more or less Hellenized culturally, the northern ones in later times were Romanized, and were also influenced by the settlement of Goths among them. The invasions of the South Slavs, however, put an end to what remained of their ethnic identity.

The Thracians are introduced here, at this late date, because they were not discussed in Chapter VI, along with the other Indo-European-speaking peoples of the Iron Age. The reason for this omission is that no skeletal material worthy of mention has been described which can be associated with them. A single skull which was probably Thracian, however, was dolichocephalic and leptorrhine.[132] Classical descriptions of Thracians make them tall, powerful, and apparently fair. As such they fit into the general scheme of the Iron Age Indo-European-speaking peoples.

Bulgaria was once Thracian country; a few centuries after its Romanization, it was submerged by a Slavic invasion, the advance guard of the movement which brought Slavic speech into Serbia. This Slavic invasion, which resulted in a permanent settlement of the country, was followed by a further invasion of still heathen Ugrian tribes under Turkish leadership,

[132] Weisbach, A., **MAGW**, vol. 29, 1899. The foregoing discussion of the Thracians is based mainly on Lebzelter, V., **MAGW**, vol. 49, 1929, pp. 61–126. See also, Pittard, E., *Les Peuples des Balkans*, pp. 139–153.

similar to the movement which brought the ancestors of the Magyars to Hungary. The subsequent history of Bulgaria was the opposite to that of Hungary; the Bulgars, who had left their eastern Russian home before the rise of the Bolgar Empire, kept their Ugrian name, but gave up their language, in favor of the speech of their Slavic predecessors. Whereas the Magyars became Catholics, the Bulgars adopted Orthodox Christianity. The next invaders of Bulgaria of importance were the Ottoman Turks, who took over the fertile Danubian farm lands, and settled large colonies of Asiatic Turks on them. Sporadic invasions of Tatars from South Russia mingled themselves with this Turkish body. At the time of the Russian conquest of the Caucasus, many Moslem Cherkesses fled to Bulgaria to avoid submission to Christians.

Since the war, many of the Turkish peasants have left Bulgaria, and many of the Cherkesses as well. There are still islands of these people throughout the country, but especially in the eastern lowlands, and there are minor colonies of Greeks, of Tatars, and of Rumanians. To the west, the Bulgarians occupy the greater part of Yugoslavian Macedonia, and border in this neighborhood on the Albanians. To the south, they extend to the head of the Aegean, where their settlements are interspersed with those of Turks and Greeks. Most of the Bulgarians are still Orthodox Christians, but a large minority, especially in Macedonia, is Moslem.

The stature of the Bulgarians varies regionally from 166 cm. to 168 cm.;[133] the tallest are found in Macedonia, and also in the very northeastern part of Bulgaria. There is a strong social segregation on the basis of stature; students at the Sofia Military Academy had, in 1906, a mean stature of 171.5 cm.;[134] other socially selected samples rise to 170 cm. The Bulgar colonists who live in the Crimea have a mean of 169 cm., those in the Rumanian Dobruja, 167 cm. The mean cephalic index of over 5000 Bulgarian soldiers is 79.6; this varies within the kingdom of Bulgaria from 80.8 in the north, to 79.9 in the southwest, and 78.2 in the south. Christian Bulgars of Macedonia have a mean of 83.3, in the region of Monastir this rises to 85; Moslem Bulgars are less brachycephalic, with a mean of 80.5, while in the neighborhood of Salonika small local samples of Bulgars are actually dolichocephalic, with a mean of 76.4, and in the neighborhood of Adrianople in Turkish Thrace, the mean is only 78.3. Bulgarian émigrés in the Crimea have a mean of 78.7.

[133] Wateff, S., **BMSA,** ser. 5, vol. 5, 1904, pp. 437–458.
Drontschilow, K., **AFA,** vol. 42, 1915, pp. 1–76.
Hasluck, M., and Morant, G. M., **Biometrika,** vol. 21, 1929, pp. 325–334.
Kirkoff, N., **BMSA,** ser. 5, vol. 7, 1906, pp. 226–233.
Lebzelter, V., **MAGW,** vol. 59, 1929, pp. 61–126; vol. 53, 1933, pp. 233–251.
Nosov, A., Z. **AntrK,** vol. 3, 1929, pp. 1–53; **PCZA,** 1930, pp. 311–312.
Pittard, E., *Les Peuples des Balkans.*

[134] Kirkoff, N., **BMSA,** 1906.

Thus within the Bulgarian people there is a strong tendency toward dolichocephaly, strong enough to impress mesocephaly upon the nation as a whole. The strongest expression of this tendency is found in the southern part of the kingdom, and beyond Bulgarian territory proper. True brachycephals are found only among the Macedonian Bulgars who live in close contact with Albanians.

The Bulgarians of the kingdom have heads of moderate size, with a mean length of about 189 mm. and a breadth of 150 mm.; they are comparable in this respect to the longer-headed Greeks. Their faces, however, are narrower than those of most Balkan peoples; the minimum frontal mean is 105 mm., the bizygomatic 139 mm., and the bigonial 108 mm. As with the Greeks, the jaw is wider than the forehead, but both widths are much narrower than with the latter. The face height, 121 mm., is moderate, the facial index, 87, mesoprosopic. On the other hand the upper facial index, 55, is relatively high. The ratio between the two facial indices assumes a Mediterranean position. The nasal diameters, 55 mm. by 36 mm., yield a moderately leptorrhine index, 65.

So far, the metrical position of the main group of Bulgarians is that of a moderately tall-statured Mediterranean group, with the addition of some brachycephalizing agent in a minor numerical position. The pigmentation of the Bulgars, while lighter than that of the Greeks, is predominantly dark. About 25 per cent have pure dark eyes, about 15 per cent light and light-mixed; the remaining majority are dark or evenly mixed. The head hair is dark brown or very dark reddish brown in almost the entire group; even among children, definitely blond combinations of hair, eye, and skin color do not exceed 10 per cent of the whole. Among adults light head hair is rare. The beard, however, shows the same tendency to disproportionate lightness found among Albanians, Montenegrins, and Cretans, but not among Greeks; the brunet colors found in about 90 per cent of the head hair occurs in only 50 per cent of the beards. Medium and light brown beards account for most of the rest. There is a notable absence of ash-blondism in this group.

Most of the Bulgars have straight nasal profiles; concave forms are found principally in the northwest, adjoining Serbian territory, where they amount to 12 per cent. Convexity is rare among all Bulgarians, but least so in Macedonia. The snubbed tip so characteristic of northern and eastern Slavs is by no means unknown among them, but is in the minority.

The Bulgarians are a composite people, with the following racial elements easily discernible: (a) a medium to tall-statured Atlanto-Mediterranean; (b) a partially blond Neo-Danubian, of typical snub-nosed form; (c) a Nordic; (d) a Dinaric, with the usual Alpine corollary; (e) a brachycephalic central Asiatic Turkish or Tatar form. The basic element is the

Atlanto-Mediterranean, which probably goes back to the Neolithic; the Neo-Danubian is probably of both Slavic and Ugrian introduction, although some of it may be older; the Nordic may be of several origins, including Thracian; the Dinaric is simply the result of Bulgarian admixture with local elements in Macedonia; the Turkic is found mostly in eastern Bulgaria, and then among townsmen and shepherds rather than among agriculturalists. Of these varied elements, the first two are the most important, and the first more than the second. The presence of a strongly entrenched Atlanto-Mediterranean population of Neolithic date in all of the lowland Balkans south and east of the Iron Gate is becoming increasingly evident. In Bulgaria it is geographically most concentrated along the southern ethnic periphery, and among Bulgarian colonies abroad, as in the Crimea.

(16) RUMANIA AND THE VLACHS

The modern kingdom of Rumania consists of the provinces of Moldavia, Wallachia, Dobruja, Bessarabia, Transylvania, part of the Banat, and the Bukovina. The last four, while the majority of their inhabitants are Rumanians, have been Rumanian territory only since the World War. Moldavia is bounded on the west by the crest of the Carpathians, on the east by the Pruth River; Wallachia is bounded on the north by the Transylvanian Alps, and on the south by the Danube. Dobruja is the plain lying between the northward curve of the Danube and the Black Sea; it includes the important seaport of Constanza.

In Moldavia and Wallachia the great majority of the population is Rumanian; the same is true to a large extent of Bessarabia, but in Transylvania there are large populations of Germans and of Magyars, already discussed in previous sections. In the Banat again there are many Hungarians, and a number of Serbs, while in the Dobruja lives one of the most scrambled populations of Europe. Here Bulgars, Ottoman Turks, Tatars, Gaguz, who claim to be descendants of the Kumans, Armenians, Kurds, Caucasic peoples, and a few of almost all the other peoples of eastern Europe and western Asia are to be found. The Dobruja is as varied as the contents of an ethnological museum, and like a museum, each group clings tenaciously to everything that is its own.[135]

The inhabitants of Dobruja include, of course, both Gypsies and Jews, and Rumania is one of the greatest concentration points for both in Europe. The Jews form 5 per cent of the population of the pre-war section of the kingdom, and are especially numerous in northern Moldavia and the Bukovina, where their zone of concentration forms an extension of that in Polish Galicia. The Moldavian Jews, who are mainly of Polish

[135] Pittard, E., *Les Peuples des Balkans*, is the authority on the Dobruja.

or Russian antecedents, speak their own language, wear a separate costume, and mix little if at all with the Rumanian population.

In classical times Transylvania, Wallachia, and Moldavia formed what was known as Dacia, and the Dacians were considered to be a branch of the Thracians. The Dacians included an upper class, distinguished by the practice of wearing brimless felt hats, Scythian style, and a peasantry, among whom the men went bare-headed, with their hair long, as do the older and more conservative of the present-day Rumanian peasants. Between 105 and 107 A.D. Trajan conquered Dacia, and made it a Roman province; the warlike inhabitants, who had long resisted the Romans, fled in great numbers, while their villages were being plundered; later, many are said to have returned. The Romans placed many colonists in Dacia, and for its defense established there the permanent headquarters of the thirteenth legion. In 256 A.D. the Goths arrived, and the Romans began a hasty departure; it is likely that many of the inhabitants of the country left with them.

During the century and a half of Roman rule, the language of Dacia became Latin, and modern Rumanian is without doubt a descendant of that colonial speech. During the maximum extension of the empire, Latin and its derivatives were spoken in a wide zone peripheral to Rome, including the Iberian peninsula, Gaul, Switzerland, the Tyrol, and much of the territory lying between the head of the Adriatic and the Black Sea. Albanian, with its strong Latin infusion, must be considered a partial product of this extension; elsewhere Ladin, Romansch, and Rumanian must be considered survivals in the face of the barbarian invasions which converted most of southeastern Europe to Germanic, Slavic, Uralic, and Altaic speech.

Foreigners designate Rumanians and Rumanian speakers by the term Vlach; the Vlachs are the Rumanian speakers to be found throughout southeastern Europe, whether living in Rumania, Bulgaria, Greece, Albania, Yugoslavia, or elsewhere. The word Vlach, which is a derivative from the Gothic, by way of Slavic, means "foreigner"; it is a cognate of our own word "Welsh," used by the Anglo-Saxons to designate Kymric-speaking Britons, and of "Walloon." The modern Vlach language, while basically Latin, shares with Albanian certain structural peculiarities which it must derive from Thracian or Illyrian, and at the same time contains a large number of Slavic roots.

The use of a Romance language in Rumania today is not a simple case of a Romanized Dacian survival; the history of Rumania is too complicated to permit this explanation alone. After the departure of the Romans, Dacia was overrun by Goths, by Slavs, by Bulgars, by many kinds of Tatars, and by Ottoman Turks. It is very likely that the Vlach survival

in these lands was only partial until the late Middle Ages, when the peasants who had resisted the inroads of these conquerors were joined by their kinsmen returning from Bulgaria and Macedonia, and from beyond the Carpathians. Since then the expansion of the Vlachs in what is now Rumania has been constant and, east of the Carpathians, nearly complete.

The Vlachs have always been far wanderers; many of them are shepherds, and the pastoral life has been as important to them, until modern times, as agriculture. In Macedonia and northern Greece, and in southern Albania, Vlach colonists are nomads living in black tents like those of Arabs, and like those which one may suppose the Scythians used before them. In Dalmatia they were during the Middle Ages an important people; Dubrovnik (Ragusa) was originally a Vlach town. In the peninsula of Istria, now inhabited mostly by Slovenes and Italians, a small group of Vlach speakers, the Čiči, has resisted assimilation to this day. These Istrian Vlachs, early invaders of Illyrian territory, are the remnants of a former link in the continuity of the Roman Empire between the Atlantic and the Black Sea.

In view of the complex ethnic history of Rumania, the living Rumanians may be expected to show evidence of a multiplicity of racial origin. To native Dacian elements, which must have included a blend of indigenous Neolithic peoples with Satem-speaking Nordics, have been added whatever population the Romans brought and which did not run away, and a multitude of early Slavs whom the Vlachs absorbed. Other elements, Ugric, Tatar, and Gothic, were probably of lesser importance.

The Rumanians, as a whole, in the early part of the present century, had a mean stature of roughly 167 cm., which is probably nearly representative today.[136] There is little regional variation; what there is indicates that the mountaineers of the northern Rumanian Carpathians may be taller than the rest, since the villagers of Fundul Moldovii, studied by Rainer, have a mean of nearly 170 cm.; those living on the Bessarabian plain amongst the Ukrainians seem to be the shortest, with a mean as low as 165 cm. A greater variation is found in the cephalic index; on the plains of Moldavia and Wallachia, and in the Dobruja, the Rumanians

[136] Besides Pittard's book, sources on the Rumanians are:
Biasutti, R., **APA**, vol. 51, 1921, pp. 154–184.
Bielskii, P. A., **RAJ**, vol. 7, 1907, pp. 146–164.
Himmel, H., **MAGW**, vol. 18, 1888, pp. 83–84.
Lebzelter, V., **Anth**, vol. 45, 1935, pp. 65–69.
Papilian, V., **RDAP**, vol. 33, 1923, pp. 337–341
Pittard, E., and Doniči, A., **BMSA**, ser. 7, vol. 8, 1927, pp. 38–50; **BSGA**, vol. 3, 1927, pp. 13–14; vol. 4, 1928, pp. 29–30.
Pittard, E., and Sergent, E., **RDAP**, vol. 29, 1919, pp. 57–76.
Rainer, F. I., *Enquêtes anthropologiques dans trois Villages Roumains des Carpathes.*

are as a rule mesocephals or sub-brachycephals, with means of 80 to 81; they are nearly as long-headed as the Bulgarians. In the mountains, however, they are fully Dinaric or Alpine in their brachycephaly, with a mean of 85.4 in Fundul Moldovii in the Bukovinian highlands, and of 86 in Bukovina in general, where they equal the brachycephaly of the Huzuls. Within the curve of the Carpathians, they are also completely brachycephalic; means from Rumanians in Transylvania and in the Banat lie mostly between 84 and 85, although in the village of Drağuş, an old and completely Rumanian settlement lying just inside the bend in the mountain crest where the Transylvanian Alps become the eastern Carpathians, and not far from the Saxon city of Kronstadt, the mean is 86.6.

We are dealing, therefore, with two kinds of Rumanians; the mesocephalic ones of the eastern plains, and the brachycephalic ones of the Carpathians and the lands to the west. The Carpathians form a sharp boundary delimiting the eastward and northeastward extension of Alpine brachycephaly in Europe. This boundary shows little regard for language or for ethnic tradition.

The Rumanians of the plains show a general metrical similarity to the Neo-Danubians of the Slavic countries to the north, and at the same time a relationship to the longer-headed Bulgarians. The village of Nerejul Mare, some eighty miles north of Bucharest on the southeastern slope of the Carpathians, will serve as an example of the plains population, although the mean cephalic index of its inhabitants, 81.5, is higher than in some districts. The mean stature is 166.8 cm., the relative sitting height 52.7. Eighty-eight per cent of the men have black or dark brown to brown hair, the rest light brown or blond. Pure dark eyes are found among 54 per cent, light eyes among 11 per cent, with the rest mixed, mostly dark-mixed. Thus the population is prevailingly brunet, as well as moderately tall, intermediate in body build, and sub-brachycephalic.

The mean head length of 186 mm., and breadth of 151 mm. show a moderately small head size; the auricular height of 125 mm. is relatively high. The face is of moderate size, with a height of 121 mm., and breadths of 102 mm. for the minimum frontal, 140 mm. for the bizygomatic, and 106 mm. for the bigonial. The nose is small, with a height of 53.2 mm. and a breadth of 34.2 mm. The face is mesoprosopic, with a facial index of 86, and leptorrhine, with a nasal index of 65. While these cranial and facial indices place the inhabitants of Nerejul Mare definitely in the same class with the peasantry of most of Russia, the intensity of hair and eye pigmentation, and the narrowness of the forehead and nose, as contrasted to the breadth of the jaw, suggest the brunet long-headed element in Bulgaria and Greece. Rainer finds these moderately tall Mediterraneans among his villagers, as well as individuals of Neo-Danubian, Slavic-looking

type; Alpines and Dinarics are partly responsible for the elevation of the cephalic index, and Norics are present as a Nordic by-product. In Moldavia as a whole, however, the Neo-Danubian and Black Sea Mediterranean forms are the two elements of greatest importance, and the same is true of Wallachia.

The mountaineers of Fundul Moldovii, in the Bukovina, are taller than the villagers just studied, with a mean stature, quoted above, of 169.5 cm.; their cephalic index mean is 85.4, while their nasal index reaches the low mean of 60. They are somewhat lighter eyed than the plainsmen, and darker haired. Their heads are broader, with a mean width of 157 mm., rather than shorter, and hence larger. Their faces are longer (124 mm.) and broader (144 mm.), while both foreheads and jaws also exceed those of the Moldavian villagers in breadth, and their nasal lengths (56.4 mm.) are considerably greater. Fifteen per cent have flattened occiputs. Although only 20 per cent have convex nasal profiles, in the great majority the forward jut of the nose, accompanied by a straight or wavy profile, is great.

The Fundul Moldovii people are in great majority Dinarics; a few appear Alpine, and a few others Noric. By and large, if the inhabitants of this village were transported to northern Albania and given a change of costume, few anthropologists would be able to tell the difference between the newcomers and the native tribesmen. The inhabitants of Drağuş, farther south and on the Transylvanian side, and no farther from Bucharest than Nerejul Mare, are just as Dinaric metrically as the Bukovinian villagers; their heads are, in fact, shorter, with a mean length of 182 mm., as are their faces; they resemble to a certain extent the Dinaric form common among Serbs.

Leaving the political boundaries of Rumania, we find two groups of Vlachs who have been the subjects of special study; those of Macedonia[137] and of Istria.[138] The Vlachs of Macedonia are the tallest of the many varied ethnic groups which compose that region, with a mean stature of 168 cm., and have the greatest absolute head length (188 mm.). They are low brachycephals, with a mean cephalic index of 83, are predominantly dark-haired and dark-eyed, and straight-nosed. They show some Dinaric influences, as do all the peoples of Macedonia; on the whole, however, their closest affiliation is with the brunet mesocephals and dolichocephals of the eastern Balkan area. There are, nevertheless, a few blonds among them, and these are usually Nordic.

The Istrian Vlachs, on the other hand, are complete Dinarics with a mean stature of 169 cm., a cephalic index of 86, and head and facial

[137] Hasluck, M., and Morant, G. M., **Biometrika**, vol. 21, 1929, pp. 322–336.
[138] Schück, A., **MAGW**, vol. 43, 1914, pp. 210–234.

dimensions which cannot be distinguished from those of most Dinarics. In their high brachycephaly, however, and in their facial and nasal lengths, as well as in a predominant brunet tendency, they are much closer to the Tyrolese, and especially to the Ladin-speakers, than to the Slovenes among whom they live. They are also very similar to their distant linguistic relatives in the Carpathians.

The Vlachs, a widespread and numerous people in southeastern Europe, are the descendants of Romanized aborigines, and of other peoples whom these latter have absorbed. They have no racial homogeneity, but vary regionally according to the races long seated in the regions where they live. In the northeast, where the Moldavian plain forms a continuation of the Black Earth region of southern Russia, the Neo-Danubian type of the Black Earth region is predominant; in the southeast, where a local Atlanto-Mediterranean type is concentrated, the Vlachs tend to assume that form; west of the Carpathians, and near the crest of that range, they are Dinarics of the first rank, comparable to that other group of mountain-dwelling speakers of Neo-Latin, the Ladiner.

In studying the racial composition of southern Russia, there was evidence of a moderately tall, long-headed, brunet Mediterranean form, which is concentrated along the northern shore of the Black Sea, but which also appears sporadically in the entire Russian population. To western Europeans and Americans, it is better known than its frequency would warrant, for it is exemplified by several world famous ballerinas and opera singers. This is the Mediterranean racial division which the Russian anthropologists call Pontic[139] and which the Poles recognize as a very minor element in their own population. It is with little doubt of Neolithic date in southern Russia, Rumania, Bulgaria, and the Hellespont region, and probably in Greece and the Aegean. In most of Thrace it seems more basic than the Danubian, or at least more common. What its relationship may be to the introduction of the Neolithic economy into Europe by land or by sea, cannot be determined without more data.

(17) THE OSMANLI TURKS

The best known and most numerous of the living Turkish peoples, the Osmanlis, today form the principal element in the population of Asia Minor, while colonies of them, left behind by the recession of Turkish power from southeastern Europe, are to be found here and there in Yugoslavia, Albania, Greece, Bulgaria, and Rumania. Only in the present Turkish territory west of the Bosporus do they form at the present day a majority in any European area which is a political entity. Individual Turks still occupy positions of importance in some of the former Turkish

[139] Bunak, V., **ZFMA**, vol. 30, 1932, pp. 441–503.

provinces outside of Europe, as in the Yemen; Turkish families form the nucleus of the aristocracy in others, as in Egypt.

The first Turks to concern themselves with Asia Minor were the Seljuks, a nation of Turks or Turkomans called at that time Ghuzz, who were converted to Islam in what is now Russian Turkestan about the year 1000 A.D. After conquering Persia, they entered Armenia in 1048 A.D. and during the rest of the eleventh century gradually took over Asia Minor, although they were more interested in the civilized Moslem centers of Syria and Iraq. Starting about 1070 A.D., tribe after tribe of Turkish nomads from central Asia and Turkestan entered Asia Minor across northern Persia, in search of fresh pastures. Many of the Christian peasants of the peninsula abandoned their farms, turned to the cities, or became nomadic themselves; this movement was further fostered by the great destruction of property consummated by the Mongols.

The Osmanli Turks, later comers than the others, did not arrive in Asia Minor until 1227 A.D., and numbered but a few thousands. About 1300 A.D., under their leader Osman, they obtained control of the Seljuk empire, and the Ottoman rule began at that time. They converted many of the Christian natives, left alone by the Seljuks, to Islam, and the name of the nation as a whole became that of the founder of the Ottoman dynasty.

It cannot be denied that the present-day Turks of Asia Minor have absorbed much of the pre-Turkish population, but that their ancestors came in great numbers from central Asia is equally true. The Turkish invasion was not a simple, connected event, but a long succession of immigrations of different kinds of Turks over a long period of time. The heterogeneity of these movements is seen by the retention in the present Turkish population of Anatolia of old distinctions; the Yürüks, for example, who still pasture their flocks on the hills of Cappadocia and Cilicia, retained their old central Asiatic manner of life with little change until the rise of the Turkish Republic, and the Kizilbashes, in eastern Anatolia, who are Shiite Turks from Persia, are recognized as a separate group.

The Christian population of Turkey, or that remnant of it which has remained unabsorbed, had until recent years always been numerous; it consists mostly of Greeks, many thousands of whom have been sent back to Greek soil, and of Armenians, a large proportion of whom have emigrated during the present century to all quarters of the earth, and in especially large numbers to America. Jews as well as Christians survived centuries of Turkish rule; throughout mediaeval and modern history Moslems have behaved with greater consistency and with less violence toward Jews than have Christians.

The modern Turks of Anatolia differ little in most of their metrical characters from peoples whom we have already encountered in central

and southeastern Europe, as the following résumé will make clear.[140] The mean stature for Anatolia is 167 cm.; this varies from 169 cm. in the Smyrna district and 168 cm. in the Dardanelles-Marmora Sea region, and in Kastamuni on the Black Sea shore, to 166 cm. in the eastern provinces, on the flank of Armenia. The bodily build is often thick-set or lateral; this is shown by a relative sitting height of 54. The relative span, 104, is moderate, and varies from 103 in the west, to nearly 105 in the east. The same is true of bodily proportions in general; the lateral form is much more typical of the eastern provinces than of the Aegean and Pontine shores.

The head form of the Turks as a whole is only moderately brachycephalic; 84.2 is the mean for Anatolia, and this varies from 81.8 in Brussa, between Smyrna and the Hellespont, to 85.4 in the eastern provinces, and 86.6 in Kastamuni, on the southern shore of the Black Sea. The western and southern Turks are low brachycephals, the eastern and northern ones high. In the regions of Brussa, Smyrna, and Konia, there is, therefore, an important long-headed minority. For the most part the heads of Turks are not large; the mean length for Anatolia is 181.6 mm., the breadth 152.6 mm., while the auricular height mean is 126.1. These dimensions could easily be matched among Yugoslavs or Macedonians. In Smyrna, the longest-headed province, the mean head length rises to nearly 184 mm., in Kastamuni it falls to 180 mm. The breadth similarly varies between 150 mm. and 156 mm.; even the roundest-headed region has a relatively small head breadth. It is interesting to note that the Greeks of the north shore of Asia Minor have the same head form as the Turks, but to a more exaggerated degree; with a length mean of 180.7 mm., breadth of 157.6 mm., and cephalic index of 87.2.

The faces of the Osmanli Turks of Anatolia, as well as their head vaults, have dimensions reminiscent of southeastern Europe. The total face height mean for the whole is 122 mm., and this varies little throughout the region. The bizygomatic mean, 140 mm., is also relatively constant, but narrowest in the Smyrna district. The minimum frontal, about 105 mm., is not excessive, nor is the bigonial, 108 mm. In these dimensions the Turks resemble Balkan Mediterraneans and Alpines; their faces are

[140] The principal work on the physical anthropology of modern Turkey is Wagenseil, F., **ZFMA,** vol. 29, 1931, pp. 193–260.

Other references consulted are:

Crowfoot, J. W., **JRAI,** vol. 30, 1900, pp. 305–320.

Elisiev, A., **IILE,** vol. 68, 1890, col. 219 ff.; 1891, vol. 71, col. 62 ff. Résumé in **Anth,** vol. 3, 1892, pp. 477–481.

Kansu, Ş. A., **TAM,** vol. 7, 1931, pp. 3–15, 17–19.

Luschan, F. von, **JRAI,** vol. 41, 1911, pp. 221–244; **AFA,** vol. 19, 1890, pp. 31–54.

Luschan, F. von, and Petersen, E., *Reisen in Lykien, Milyas, und Kibyratis.*

Županič, N., *Etnolog,* 1927, pp. 87–130. Résumé in **AnthPr,** vol. 6, 1928, pp. 95–96.

not long enough for exaggerated Dinarics. Like the Greeks and the peoples to the west of the Black Sea, they preserve a forehead-jaw ratio which emphasizes the width of the mandible. The nose, with a mean height of 57 mm. and a breadth of 35.3 mm., is, however, fully Dinaric. It is largest (59 mm. by 36 mm.) in the eastern provinces, smallest (56 mm. by 35 mm.) in Smyrna. The nasal index of 62.4 is leptorrhine, but not as much so as that of Albanians.

The unexposed skin color of the Turks is mostly brunet-white or swarthy, (von Luschan #11–16), the head hair color, in 90 per cent of cases, dark brown. Black hair, however, is found in less than 5 per cent, and blondism is rare. The ratio of dark brown hair is constant, except in the eastern provinces, where it is nearly 100 per cent. The beard hair is often lighter than the head hair; only 70 per cent are black or dark brown, while reddish shades are found among nearly 10 per cent. Reddish and blondish beards are by far commoner in the western and northern provinces than elsewhere, and are in these places found in one-third of the group observed.

Pure dark eyes are found in about 40 per cent of the total, while another 40 per cent possesses dark-mixed eyes, many of which would appear brunet upon casual observation. The remaining 20 per cent is almost entirely composed of men who possess evenly mixed or light-mixed irises, with but less than 2 per cent of pure lights. On the whole, the Anatolian Turks are prevailingly brunet in pigmentation, but brunet in a condition in which the skin is brunet-white, the hair dark brown, and the eyes brown or dark-mixed. There are several shades of brown in the eye color, and it is apparent that more than one brunet strain is present. The virtual absence of black hair, however, the presence of rufosity, and the high ratio of mixed eyes, when combined with the metrical data, indicate that the principal brunet strain is some form of Alpine.

Fifty-four per cent of the Turks have some occipital flattening, and this ratio rises to 80 per cent in the province of Kastamuni. In the west, it falls to 38 per cent, and in the eastern provinces is only 42 per cent. The associated Dinaric character of a convex nasal profile is found among 58 per cent of the total; the ratio is slightly higher in the north and east than in the west. The nasal wings are usually compressed to medium; flaring forms, such as one associates with mongoloids, are very rare, as are concave nasal profiles. An excessive development of the malars is uncommon, but more frequent in the east than in the west. The epicanthic eye-fold, typical of Mongols, is almost unknown in Turkey. The beard is often heavy, and the body hair on the heavy side of medium.

On the basis of the metrical and morphological data outlined above, we may dismiss the theory that the Anatolian Turks are in any sense mongoloid. It may be possible to find individuals with some recognizable

mongoloid features, but no more frequently than in most countries of Europe. The Anatolian Turks are for the most part Cappadocian Mediterraneans, with a mixture of Alpines in sufficient quantity to produce the Dinaric transformation. Only in Kastamuni, on the shore of the Black Sea, and in the provinces which contain large populations of Armenians and other non-Turks, does the brachycephaly of the Osmanlis reach full Dinaric proportions. In the west and south, there are enough unassimilated dolichocephalic factors left to form a considerable minority.

If the Turks are for the most part Cappadocians Dinaricized through Alpine mixture, this simply means that the zone of reduced Upper Palaeolithic survivors extends into Anatolia; the skeletal types found among the meager remains from Alishar Hüyük have mingled, with a result parallel to that experienced throughout the entire Alpine racial zone in Europe. This conclusion would mean that the Turks are not Turks at all, except in speech and tradition, except for one thing: the remnants of the pre-Turkish population are more brachycephalic, more typical members of this Near Eastern Dinaric race than are the Turks themselves. We have already seen that the Asia Minor Greeks are even rounder-headed than the Turks of Kastamuni; they are also 2 cm. shorter in stature. As we shall presently see, the Armenians themselves likewise exceed the Turks in their Dinaric or Armenoid character. Furthermore, the Takhtadshy and Bektashi, members of heretical sects in Asia Minor who are supposed to have little Turkish blood, are rounder and shorter-headed, and more Alpine and Armenoid in every way, than the Turks as a whole.[141] The Turks, therefore, while to a large extent descended from the pre-Turkish population, are perceptibly different as a group from its most fully authentic survivors.

With this directional lead, we may proceed to examine the most fully Turkish people in Turkey, the Yürüks, pastoral nomads of Cappadocia and Cilicia, who are supposed to have mixed little with non-Turks or other kinds of Turks since their arrival. A small but apparently representative series [142] shows them to be tall, with a mean stature of 169 cm., mesocephalic, with a mean cephalic index of 79, and largely brunet. Their faces are moderately long (124.6 mm.) and moderately wide (144 mm.). In facial features they are not at all mongoloid. If the early Turkish invaders of Asia Minor belonged largely to this type, then the racial position of the modern Osmanlis in reference to that of the previous Anatolians is easily comprehended.

In the early history of the Turkish invasions, there was some question

[141] Crowfoot, **JRAI,** 1900.
Luschan F. von, **AFA,** 1890.
[142] Luschan, F. von, in Petersen and von Luschan.

as to whether the ancestors of the Seljuks and Osmanlis were to be considered Turks in the sense of Kirghiz and Uzbegs, or Turkomans, a general name meaning Turk-like people. In view of the present evidence, it is likely that they were actually Turkomans, or at any rate Turks similar to living Turkomans and Azerbaijanis (see Chapter XI, section 5), and were thus non-mongoloid whites of a tall, long-faced, high-headed, brunet Mediterranean variety. The Turks who invaded eastern Russia, on the other hand, belonged rather to the Kirghiz type, which is a Mongol-Turkoman-Nordic mixture, and the Tatars of eastern Europe and of the Caucasus are for that reason primarily brachycephalic and partially mongoloid.

The determination of the physical type of the Osmanli and Seljuk Turks, through directional leads and the study of the Yürüks, furnish a reasonable explanation of the racial characters of the modern Anatolian Turks. If one places the contribution of the Turkish ancestors in Anatolia at about 25 per cent, and that of the previous inhabitants at about 75 per cent, the racial situation in that peninsula assumes a position in accordance with history. The indigenous 75 per cent is composed of a Cappadocian-Alpine blend, in which the latter element must have reëmerged in a manner similar to that which can be chronologically established in central Europe.

Data on the Turkish inhabitants of the present southeastern European states are very conflicting. A series of 200 from Macedonia[143] is hyper-Anatolian, with a mean cephalic index of 87, and pigmentation comparable to that of Turks in Asia Minor; another series, presumably from a different part of Macedonia,[144] is dolichocephalic, with a mean index of 77.7. Turks in Rumelia,[145] that is southern Bulgaria, and Turks in the Dobruja,[146] have cephalic indices of 82–83, and metrical and morphological features which relate them to the body of Turks in general. Owing to the fact that the Osmanli Turks of the Balkans have preferred emigration rather than assimilation since the disappearance of their European empire, it is unlikely that they have contributed much in a racial sense to populations which are now Christian, or to Moslem groups which are not Turkish in speech.

(18) NEAR EASTERN BRACHYCEPHALS; SYRIA, ARMENIA, AND THE CAUCASUS

The object of the present section is to deal with the general group of brachycephalic peoples, other than the Osmanli Turks, who live in the regions lying between Syria and the Caucasus, and including both. These

[143] Hasluck, M., and Morant, G. M., **Biometrika,** vol. 21, 1929, pp. 322–336.
[144] Lebzelter, V., **MAGW,** vol. 63, 1933, pp. 233–251.
[145] Kansu, Ş. A., **TAM,** vol. 7, 1931, pp. 13–15, 17–19.
[146] Pittard, E., *Les Peuples des Balkans.*

peoples include the various groups of Syrians, the Druses, the Armenians, the Assyrians, and the Caucasic peoples proper.

Syria, an Arabic-speaking country, is bounded by the northern Arabian desert on the east, by Palestine on the south, and by Ottoman Turkish territory on the north. It is divided into the coastal mountain sections of Lebanon on the south and the Alawiya country on the north, and the inland portions administered from Damascus and Aleppo, respectively. In the very south is the Jebel Druz, some fifty miles east of the Lake of Tiberias. The majority of the inhabitants of the Lebanon region are Christians, of both Maronite and Orthodox sects; the Druses practice a secret religion of their own which arose from a Fatemid heresy in Egypt in the eleventh century; the Alawiya or Nosairi are also Moslem heretics, being the most extremely schismatic of the Shiites.[147]

For anthropometric purposes, the Syrians may be divided into (1) the Syrian Bedawin, including the Ruwala, Akeydat, and Maualy, (2) the desert border groups, including the towns of Homs, Hama, and Aleppo, and the districts of Mharda, Hafar, and Hijana, (3) the mountain groups, including the Druse, the Lebanese, the Mitwali (Lebanese Moslems), and the Alawiya (Alouites). The Syrian Bedawin are dolichocephalic Arabs of pure Mediterranean race; the desert border groups are intermediate between the former and the mountain people, with mean cephalic indices of 77–79 for the country people, and 81–82 for the city dwellers. It is the third group, which is fully brachycephalic, that deserves special attention here. Both the Lebanese and the Druses have mean cephalic indices of 86, and the Mitwali of 87, while the mean of the Alawiya is 83.[148]

The mountain peoples, Lebanese, Alawiya, Mitwali, and Druse, are all racially very much alike, whatever their differences in religion, and a study of one will suffice for the whole. The Lebanese will serve as an example. They are of a little more than moderate European stature, with a mean of 167 cm.; their bodily proportions are medium, from the metrical standpoint; they are thicker set as a rule than Bedawin, and are built more often like the Anatolian Turks; some, who follow sedentary occupations, incline to corpulence.

[147] Lammens, H., *Islam, Beliefs and Institutions.*

[148] Principal sources on Syria are:

Kappers, C. U. A., and Parr, L. W., *An Introduction to the Anthropology of the Near East.*

Seltzer, C. C., *The Racial Characteristics of Syrians and Armenians.*

Shanklin, W. M., **JRAI,** vol. 65, 1935, pp. 375–390.

Shanklin, W. M., and Izzeddin, N., **AJPA,** vol. 21, 1936, pp. 217–252; vol. 22, 1937, pp. 381–415.

Also other material in preparation by W. M. Shanklin, and a series of over 600 adult male Druses by Miss Izzeddin. Part of Miss Izzeddin's series, the Matn sub-group, has already been published by Kappers and Parr. Any reference to her work here is through the medium of this publication.

In their head and face measurements, they are virtually identical with the more brachycephalic groups of Anatolian Turks studied in the last section; they likewise fall extremely close to the total means for Ghegs in northern Albania, in all characters studied except the nasal dimensions; the Lebanese being shorter and slightly broader-nosed. The nasal dimensions of the Lebanese are 55 mm. by 35 mm., with a nasal index of 63.

Most of the Lebanese have brunet-white unexposed skin color, although some 20 per cent have pinkish-white skin, as light as that of most northern Europeans. About 50 per cent have black hair, a higher incidence than was found among Turks, while most of the rest have dark brown. Eighty-three per cent have pure brown eyes, with dark brown in the majority; the principal mixed color scheme is green-brown. Some 5 per cent have eyes which are either pure or nearly pure blue. The hair is usually wavy, and often fine in texture; it is often heavy on the beard and body, while the eyebrows are frequently thick, and in 77 per cent, concurrent.

The noses of the Lebanese, convex in profile in 53 per cent of the group, have usually a slight to medium nasion depression, a high, medium to broad root, and a high, broad bridge; the tip is of moderate thickness in most cases, and usually elevated; the wings are seldom compressed. Their foreheads usually have little slope, their browridges are of moderate development; occipital flattening of some degree is present in almost all who were born in Syria.

The Lebanese are Mediterraneans of the same type found in Palestine and northern Arabia, brachycephalized through the agency of the Alpine race. They differ from the brachycephals of Anatolia, who antedate the Osmanli Turks in origin, in very few characters; one is the possession of black hair, as opposed to dark brown, in half the group; another is a greater incidence of pure brown eyes. The difference between the two is largely due to the fact that the Arabian type of Mediterranean is naturally more brunet than the principal element in Anatolia. Among the Lebanese, dark brown-eyed, black-haired individuals tend to be shorter, longer-headed, and narrower-faced than the group as a whole, and thus lean in a Mediterranean direction; the blonds or near-blonds are the tallest, longest-faced, and narrowest-nosed. They thus assume the Noric form typical of a Nordic strain in this type of mixture. The Lebanese on the whole are Dinaricized Mediterraneans, but do not entirely merit the term Armenoid, any more than do the Osmanli Turks.

We cannot date the brachycephalization of the Syrians exactly, but we know that brachycephals began travelling from that part of the world by sea as early as approximately 2200 B.C. Cyprus, an early center of maritime Bronze Age activity, is today inhabited by a Graeco-Turkish population, in which the Greeks, both linguistically and in religion, are

the preponderant element.[149] The living Cypriots are, like their Dinaric forebears, moderately tall, with a mean stature of 169 cm.; they are moderately brachycephalic, with a mean cephalic index of 82.5, and their anthropometric character in general is fully Dinaric. Slightly more than half of the Cypriots have brown eyes, and of the others the majority are greenish-brown. Thirty-five per cent have black hair, most of the others, dark brown. On the basis of available information, it is possible to admit both Greek and Turkish influences in a physical sense, while the major inheritance must be from the Cypriots of the Bronze Age.

It has long been believed by physical anthropologists that the quintessence of Near Eastern brachycephaly is to be found in the Armenians; the racial term Armenoid being named for them. The Armenians have long been established in the territory which is now only partly theirs; they had, before the arrival of the Turks, a powerful kingdom, which covered most of the territory between the Gulf of Alexandretta and the Caucasus. Their kingdom had its roots in the Early Iron Age, and a possible derivation, in part at least, from that of the Hittites. The endogamy of the Armenians in modern times is well known, and there is every reason to suppose that they have preserved a pre-Turkish racial complex with some fidelity. Endogamy, however, functions best under adversity, and there is reason to believe that in the time of their greatest power the Armenians absorbed other Near Eastern peoples into their linguistic and cultural body. There was, furthermore, a strong social division into military aristocrats and peasantry.

The present Armenians are greatly scattered, and so great has been the exodus from their own country that series measured elsewhere should show little influence of selection. A series of 1100 men, measured in America but adult at the time of immigration, furnishes ample material for the study of this people.[150] They belong, as is well known, to the

[149] For an excellent account of the modern Cypriots, and a survey of the history of Cyprus, see *The Memoirs of Sir Ronald Storrs.*

For the anthropometry of the island, see: Buxton, L. H., **JRAI,** vol. 50, 1920, pp. 183–235.

[150] I am relying almost entirely upon an unpublished work: Hughes, B. O., *The Physical Anthropology of Native Born Armenians.* Accepted as a PhD. thesis at Harvard University, 1938.

Other sources include:

Bunak, V., *Crania Armenica.*

Chantre, E., *Récherches anthropologiques dans l'Asie Occidentale;* **BSAL,** vol. 13, 1895, pp. 49–101.

Erckert, R. von, **AFA,** vol. 18, 1889, pp. 263–281; vol. 19, 1890, pp. 55–84, 211–249, 332–356.

Seltzer, C. C., *The Racial Characteristics of Syrians and Armenians.*

Twarjanowitsch, J. K., *Materialen zur Anthropologie der Armenier.* Résumé in **AFA,** vol. 26, 1899, pp. 178–184.

Weissenberg, S., **AFA,** vol. 13, 1915, pp. 383–387.

planoccipital brachycephalic division of the white race, a division which, as we have seen, possesses only such unity as that which results from a common principle of heredity.

They are men of medium stature, with a mean of 166 cm.; this varies extensively in accordance with geography; the eastern Armenians, from Van, Erivan, Bitlis, and Erzerum, are considerably taller than those in the west, who come from Sivas, Kaisarie, and Marash, while those geographically intermediate, from Kharput and Diarbekr, are intermediate in stature as well. The extremes are the Van people, with a mean of 169 cm., and those from Kaisarie and Marash, with means of 164 cm. They are, for their weight, very heavy people, with a mean of 160 lbs.; the lateral bodily habitus which the foregoing weight-stature ratio indicates is predominant in all regional groups, except Van. Members of the western groups, on the whole, are more lateral than those from the east. The relative span, 104, and the relative sitting height, 53.2, fall into the general Alpine category.

The mean cephalic index for Armenians is 85.4; this varies from 84 in Van and Erivan, to 86 in Sivas and 87 in Erzerum. The mean head length, 185 mm. for the total, reaches 188 mm. in the east, and 183 mm. in the west. The breadth mean, 158 mm., is relatively constant. The auricular height, with a mean of 126 mm., is also subject to this east-west differentiation; local means reach 129 mm. in the east, 124 mm. in the west. The lateral dimensions of the face, 108 mm. for the minimum frontal, 144 mm. for the bizygomatic, and 110 mm. for the bigonial, show no geographical variation; they are comparable to the breadth dimensions found among moderate-sized Dinarics in Europe, although the jaw width is more reminiscent of Asia Minor and Greece. The inverse jaw-forehead ratio is the opposite from that of Albanian Dinarics.

Vertical diameters of the face are again divided geographically, the total face height mean is 128 mm., ranging from 130 mm. in the east to 125 mm. in the west; the upper face height similarly varies from 78 mm. to 75 mm., with a mean for the whole of 77 mm.; the facial and upper facial indices vary in consequence. The group as a whole is on the upper border of mesoprosopy, and mesene. Only Van is leptoprosopic and leptene.

The Armenian nose is extremely long, with a mean height of 60 mm., and quite wide, with a mean breadth of 38 mm. The nasal index, 64, is leptorrhine, but by no means as leptorrhine as the noses of European Dinarics. The difference between Albanian Dinaric and Armenian nasal indices lies entirely in the breadth. Like all other vertical dimensions, the nose height among Armenians is subject to geographical variation, but this is slighter than with most other characters, since a long nose is an

essential Armenoid feature. The width also varies, from 37.4 mm. in Van, to 38.4 mm. in Kaisarie.

Taking these measurements as a whole, there is seen to be a strong east-west division within Armenia; this division is especially prominent in weight, stature, segments of stature, head length, the cephalic index, the auricular height, the face heights, and to a lesser extent in both nasal dimensions. Linear traits of the head and face as well as of the body are greater in the east, while the lateral dimensions are much the same everywhere.

The Armenians are metrically very much like the northern Albanians in most characters; the chief differences are the greater face length and greater nasal breadth of the Armenians. Although the differences between Armenians and Albanians are no greater than those between a number of European groups which collectively enjoy the designation Dinaric, the Armenians do stand at one extreme of the Armenoid-Dinaric combination, while the Osmanli Turks and the Syrian brachycephals fall much closer to the European end.

The skin color of the Armenians has been designated as pinkish-white, brunet, swarthy, and light brown. The two middle categories share almost equally over 85 per cent of the total. Pink skin, which includes 8 per cent, is far commonest at Van, light brown at Kaisarie. The east-west division holds in skin color as in other features. The hair color is mostly dark brown; 58 per cent belongs to this category while black and medium brown account for 18 per cent each. The remaining 6 per cent is almost entirely reddish brown. The men with black and dark brown head hair have, as a rule, beards of the same color; but the brown-haired men have reddish brown or red beards, in most cases. Thus, at least 75 per cent of the group may be considered completely brunet in hair color tendencies. The brown and reddish hair shades are commonest in the Lake Van region, the black in the south and west, nearest Syria.

To match the ratio of pure brunet hair, one finds 73 per cent of brown eye color; this is divided almost evenly between dark brown, light brown, and mixed-brown classes, the latter implying an iris form in which more than one brown shade is present. The high ratio of this class, one-fourth of the total series and one-third of the pure dark eyes, is due to the accuracy of the observer rather than to any peculiar condition. It means that more than one brunet strain is present among Armenians, a fact which other evidence confirms. Dark brown eyes are most numerous in the west, where they form 36 per cent of the whole, and rare in the Lake Van region, where they form 13 per cent. Mixed and light eyes, mostly green-brown, but including 2 per cent of pure blue, total 34 per cent in Van, and but 11 per cent in Kaisarie.

The hair form of the Armenians is mostly low waves; their pilosity is abundant. Beards are usually very heavy, and body hair as well; hairiness is an outstanding Armenian feature. As with most hairy people, many of the Armenians grow bald with advancing age. The eyebrows are usually thick, and in 73 per cent of cases, concurrent. The foreheads of the Armenians, unlike those of Syrians and Turks, and of many European Dinarics, are as a rule quite sloping, more so than is found in the majority of white racial groups. The browridges, however, are seldom very heavy; the heaviest are found in the east.

The Armenian nasal features are extreme and consistent; the nasion depression is usually slight, but almost always present; both the root and the bridge are very high and quite broad. It is this breadth of the nose, from root to tip, that differentiates it most from those of European Dinarics. The profile is convex in 62 per cent of cases, and very few are concave. The tip is thick in over 50 per cent of cases, and depressed in about 70 per cent. The wings are usually medium or flaring, compressed in only 20 per cent. Thinner roots and bridges and more compressed wings are characteristic of Armenians from the Lake Van country, thicker and more flaring in those from the south and west.

The Armenian orbit, high on the skull, does not permit frequent eyefolds; these are usually external or median, and are found mostly in the east. The eye opening is usually great, and there is, in nearly half the group, some obliquity of axis, although this is usually slight. The Armenians are as a rule thin-lipped, with medium to great chin prominence, a palpable bilateral cleft in the chin, and flaring gonial angles. Mid-facial prognathism is found in about one-fourth of the group, but it is seldom great; alveolar prognathism is very rare.

The occipital region is seldom protuberant, but more so among eastern than western Armenians; occipital flattening is found among 75 per cent, and its absence is commoner in the east than in the west. There can be little doubt that its intensity is partly due to unintentional cradling deformation, especially since the cradle was more commonly used in the west than in the east at the time that the men studied were infants. As in Albania, pronounced cranial asymmetry, a concomitant of unbound occipital flattening, is frequent.

In the characters of the nose, in the form of the skull, especially of the occipital region, in pilosity and in the prevalence of brunet pigmentation, the Armenians from all regions form a definite whole. Yet the variability of the different characters is so linked that the component factors in the blend may be seen upon analysis, and the composition of the Armenoid racial type revealed. The partially blond element, as best designated by eye color, is quite different from the group as a whole; persons with mixed

or light eyes are much more linear in build, taller, longer and higher-headed, longer- and narrower-faced, and longer- and narrower-nosed. The brunet skin color is associated, on the other hand, with a whole combination of characters, especially those concerned with bodily, cranial, and facial breadths; whereas the first type is Nordic, the second is Alpine in directional implication. The most brunet group, on the basis of skin color, is bimodal; it includes a long-faced, long-nosed, heavily bearded Irano-Afghan strain, and a smaller Mediterranean type, which is also a factor in the composition of the Syrian brachycephals.

The Armenoid type is a stable hybrid between two principal elements, the Alpine race and the Irano-Afghan division of the Mediterranean stock, mixed at the ratio of 2 of the latter to 1 of the former. The combination has produced a greater laterality than either parent stock, an excess of brachycephaly, and an excess of facial length and nasality. In northern and eastern Armenia, a strong Nordic infusion has altered the blend in a linear direction, and has infused a minority with partial blondism; in southern and western Armenia, a parallel infusion of Mediterranean factors, comparable to those found in Syria and Arabia, has reduced the stature and other linear dimensions, while increasing the brunet character of the pigmentation.

Thus the Armenoid race is a product of the same principle of hybridization which has produced Dinarics in Europe,[151] the chief difference being that among the Armenians the Mediterranean factor involved is Irano-Afghan, while in countries farther east it is one of several varieties more familiar to Europeans. In tracing relationships between Dinarics and Armenoids, as between groups of Dinarics, it is futile to look for historic associations, since the relationship is parallel rather than derivative. Racial analysis has indicated something that archaeology has only begun to reveal; that Anatolia, the Syrian highlands, and the Armenian plateau are not, in all likelihood, basic Mediterranean racial territory, but the former homelands of a population similar to that living in Europe during late glacial times. The Alpine race, here as in central Europe, from France to Albania, has reëmerged, and in so doing has blended with Mediterranean forms in a characteristic way. Another conclusion which one may make from this study is that Anatolia was never, until the time of the Ottoman Empire, an important highroad of racial movements; its main rôle has been that of a refuge area, and the same is true of the Syrian mountains and those of Armenia.

[151] The general application of this principle was suggested by Dr. Hughes's analysis of his Armenian material. For the conclusions as to the hybrid character of the Armenians and as to their component elements, and for the principle involved, I am indebted to Dr. Hughes, whose work on the living confirms the conclusions of Bunak derived from his study of Armenian crania. See Bunak, V. V., *Crania Armenica*.

A separate group of brachycephalic Near Eastern people living until recently in the neighborhood of the eastern Armenians is that of the Aissores, or Assyrians, Christians who still speak the old Syriac language, now used in Syria in a ritual sense only, but once widespread also in Mesopotamia. These Assyrians, Christians in Mesopotamia since their conversion in 70 A.D., were, at the time of the Arab conquest of their country, granted a firman issued by the Prophet himself permitting them to practice their religion without hindrance. Under this sanction they flourished greatly, sent missionaries to China, and founded a colony, which still exists, in India.[152] At the time of the Mongol invasions, between 1230 and 1400 A.D., their country was laid waste, and those who survived the calamity fled northward into Turkey, settling in the mountain district of Hakkiari, in Kurdish country, south of Lake Van and west of Lake Urmia. In 1914, 80,000 of them were still established there, while another 35,000 lived in Iran, near Lake Urmia, and 10,000 more had returned to the lowlands of Iraq, near Mosul. During the World War and in the two decades since, the Assyrians have suffered further political disasters which have left them homeless and have greatly reduced their numbers.

These Assyrians, whose ancestors, presumably plainsmen from Iraq, may have been no different in a physical sense from the other inhabitants of that valley, are now, after some six hundred years of living in the mountains, more brachycephalic than the Armenians.[153] Their mean stature is about 167 cm., their cephalic index mean about 87, with series by different authors varying from 85 to 90. They are almost purely brunet, and characteristically aquiline in nasal profile. Their total resemblance to Armenians, however, is not close; the faces of the Assyrians are both shorter and narrower than those of the Armenians, and their noses are likewise smaller. It is possible that mixture with Armenians produced the initial stimulus toward hyperbrachycephaly, but whatever its immediate origin, the facial dimensions show that the basic Mediterranean type involved is western, and not Irano-Afghan.

Even more of a refuge area than Asia Minor, the Caucasus mountain range and the valleys to either side provide shelter to an extremely varied conglomeration of peoples. Besides the Armenians, the Aissores, the Kurds, the Tats, who are Iranians living near Baku, and the Azerbaijani Turks, and some Tatars and Mongols, the Caucasus contains the Caucasians proper, who are the speakers of Caucasic languages, and the

[152] Browne, Brig.-Gen., J. G., **GM**, vol. 4, #6, April, 1937, pp. 431–448.

[153] Aruntinow, A., **AFA**, vol. 30, 1904, pp. 222–224.

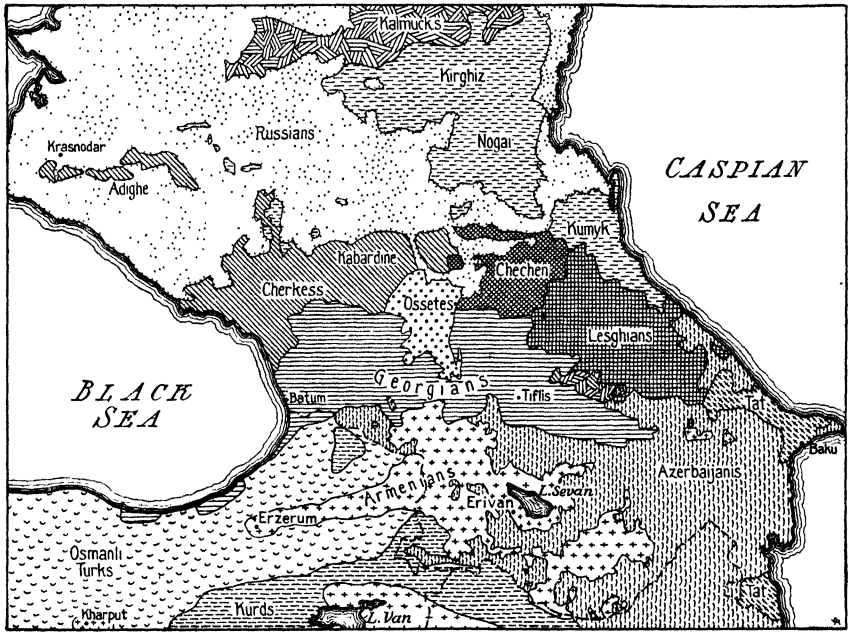
Chantre, E., **BSAL**, 1891, vol. 10, pp. 103–126; *Récherches anthropologiques dans l'Asie Occidentale.*

Djawachischwili, A., **AFA**, vol. 48, 1925, pp. 77–89.

Kappers, C. U. A., **KAWA**, vol. 36, 1933, pp. 3–11.

Ossetes, whose language is Iranian and for whom descent is claimed from the Alans, the last ethnic survivors of the Sarmatians recorded in history.[154]

The Caucasic speakers are divided into four main branches, each of which has many subdivisions; these branches are the Lesghians, the Chechens, the Cherkesses or Circassians, and the Georgians. Map 16 will show the distribution of these peoples. The various subdivisions of



MAP 16

PEOPLES OF THE CAUCASUS

The Caucasic-speaking peoples have been shown by unbroken lines and cross hatchings; Indo-European and Altaic speaking peoples by other symbols. Russians, Ossetes, Armenians, Tats, and Kurds are Indo-European speakers; Kalmucks are Mongolic-speakers, while Kirghiz, Nogai, and Kumyk Tatars are all Turkic-speakers. Small settlements of Russians, Germans, and Jews in this region have been left unrepresented, to avoid confusion. (After Jochelson, W., *Peoples of Asiatic Russia*, Map 6, with alterations and additions.)

these peoples, living in their separate valleys, follow different forms of Christianity and of Islam, while the presence of Jewish villages complicates the religious pattern. The Georgians, however, are mostly Christian, the Cherkesses mostly Moslems; with the Russian conquest of the northern slopes of the Caucasus, many of the latter emigrated to Ottoman Turkish

[154] The bibliography dealing with the Caucasic peoples is exhaustive; for a brief, lucid, and accessible exposition, however, Jochelson, W., *Peoples of Asiatic Russia*, is recommended.

territory, including Syria and the Balkans. Most of the Lesghians are also Moslems, while the Chechen are for the most part Christians, as is the majority of the Indo-European-speaking Ossetes. The Tats are Moslems.

As is frequently the case in regions of great ethnic complexity, the racial situation is simpler than the linguistic or cultural. The Tats, to begin with, are tall and mesocephalic, and resemble the Persians of Iran, to whom they are related.[155] The Ossetes,[156] who live in the middle of the Caucasus, mostly on the southern side of the watershed, are tall people, with a mean stature of 169 cm., sub-brachycephalic, with a mean cephalic index of 82, and of medium head size, a head length of 189 mm., and a breadth of 155 mm.; they are only moderately leptorrhine, with a mean nasal index of 65, and somewhat broad-faced, with a mean bizygomatic diameter of 145 mm. About half have pinkish-white skins, the other half, brunet-white; similarly over half have black or dark brown head hair, the rest, brown, light brown, or light. Some 54 per cent are said also to be brown-eyed, the rest, mixed and light. Over 60 per cent are considered definitely brunet in general pigmentation, some 10 per cent definitely blond. It is of course the latter minority, and a comparison with the other Caucasic peoples, which has given the Ossetes a reputation for blondism.

As far as one can tell from present material, the Ossetes do possess a Nordic strain, which has, however, been partly altered by local admixture into Noric; other elements are one or more forms of Mediterranean, not all of which were high-headed or long-faced, and Alpine. On the whole, the result might be called incipiently Dinaric. That the Ossetes are the result of a mixture of Scytho-Sarmatian refugees from the plains to the north with indigenous peoples is, on the basis of the physical data, quite possible.

The Caucasic-speaking peoples [157] differ from their Ossete neighbors in a

[155] Chantre, E., **BSAL,** vol. 10, 1891, pp. 103–126; *Récherches anthropologiques dans l'Asie Occidentale.*

[156] Gil'chenko, N. V., **TVMA,** 1890. Résumé in **BZL,** vol. 11, #9–10, 1891.

Djawachischwili, A., **AFA,** vol. 48, 1925, pp. 77–89.

Erckert, R. von, **AFA,** vol. 18, 1889, pp. 262–281, 297–335; vol. 19, 1890, pp. 55–84, 211–249, 331–356.

The last two are general works on Caucasian anthropometry; the first a separate source on the Ossetes.

[157] An exhaustive bibliography of the physical anthropology of the Caucasus will be found in Djawachischwili, A., **AFA,** vol. 48, 1925, pp. 77–89. Besides the comprehensive works of Chantre and of von Erckert previously cited, these include both special and general studies by the following: Aruntinow, A.; Dirr, A.; Erikson, E.; Kurdov, K.; Malinin, K.; Pantuchov, J.; Schwidersky, N.; Stshukin, J.; Vishogrod, J.; and Vorobiev, V. To this list should be added Djavakhov, A., **RAJ,** vol. 7, 1907, pp. 127–167, and Sommier, S., **APA,** vol. 21, 1901, pp. 413–457. Most of the Russian authors have published in the **RAJ,** but the works of some are to be found in the publications of the

number of respects, one of which is that they are nearly all shorter in stature. The mean stature for Georgians is 165 cm., and most of the Cherkess groups fall at the same level, although the Kabardians have a mean 2 cm. higher. The Lesghians vary by tribal groups from 164 cm. to 168 cm., while the Chechen mean is about 168 cm.

Nearly all are brachycephalic or sub-brachycephalic; the Georgian means stand consistently at about 84, as do those of the Chechens, while the Lesghians are more brachycephalic, with means of 86 and 87, and the Cherkess less so, with means of 81 and 82 on the northern side of the Caucasus, and 83 and 84 on the south of it. As a rule the faces of the Caucasic-speaking peoples are of moderate height, in the low or middle 120's, and in the middle 140's in breadth; facial indices are all mesocephalic; the noses, too, lack the great size of those of the Armenians or of the long-headed Kurds and Azerbaijanis; nasal indices are moderately leptorrhine only, with indices of approximately 65.

The Caucasian peoples are, as a whole, dark-mixed in pigmentation. In most of the tribal series, dark hair and dark eyes total well over 50 per cent, while the presence of a little more than a third of light-mixed individuals in each group is sufficient to create the impression, fostered by the Turks, that they are fair. Light skin is commoner than light hair or eyes, and it is for their skin color more than for their blondism that Circassian beauties, among others, are famous.

Aside from the Ossetes, the Georgians are the blondest, as well as the shortest, of the peoples of the Caucasus. The Cherkesses, on the other hand, are the darkest as well as the tallest and least brachycephalic; they seem, in view of their geographical location on the northeastern shore of the Black Sea, to contain much of the brunet Mediterranean or Atlanto-Mediterranean racial strain which we have already studied in Bulgaria, Rumania, and the Ukraine, and which the Russian anthropologists call the Cherkess or Pontic type when found elsewhere in Russia.

The Caucasic-speaking peoples as a whole, from an anthropometric standpoint, represent a blend between a local Alpine racial nucleus and several kinds of Mediterraneans. The Georgians and the Lesghians are the most Alpine, the Cherkesses the least so. The facial dimensions preclude, in most groups, the presence of a long-faced Irano-Afghan element in any quantity; except among the Cherkesses, the head size, with mean lengths in the low 180's, limits the possible Mediterranean elements to the smaller-headed varieties. These are apparently both Danubian and

Anthropological section of the Moscow Natural History Society (**IILE**, etc.), and of the Military-Medical Academy of St. Petersburg (**VMZ, TVMA**, etc.), as well as in those of the Georgian State University at Tiflis. In Djawachischwili's compilation, as well as in that of Farkho, A., **AZM**, 1932, #2, pp. 49–82, the reliable figures from the earlier authors are presented.

Cappadocian; there is too much true facial Dinaricism for the Danubian to be the only factor, and too much blondism and nasal concavity for the Cappadocian.

The Georgians, with a high incidence of concave noses, as well as the greatest blondism, are the most nearly Danubian; except for the Cherkesses, most of the other peoples are more Dinaric. On the whole, the Dinaricism of the Caucasian area is only partial; there are too many unaltered Mediterraneans, and too many Alpine-Danubian mixtures, which, here as in Croatia and Slovenia, fail to assume a Dinaric facial form, to make the Caucasus as Dinaric a country as the Tyrol or Albania.

Syria, Anatolia, Armenia, and the Caucasus form a zone of Alpine reëmergence on the border of Mediterranean racial territory. In all four regions there has been a major blending with Mediterraneans, and the differences between the racial characters of the regions depend upon (a) the relative degree of Alpine reëmergence, and (b) the kinds and relative amounts of Mediterranean involved in each. The linguistic complexity, involving Semitic, Uralic, Altaic, Indo-European, and Caucasic languages, merely reflects the racial complexity within the Mediterranean component of this primary refuge area.

(19) TURKESTAN AND THE TAJIKS

Beyond the stretch of steppes and desert immediately east of the Caspian Sea, where the brunet Mediterranean race, through the agency of the Turkomans, is brought into direct contact with mongoloids, lies the once densely populated oasis country of Russian Turkestan, sparsely watered by the Amu Daria or Oxus, which rises in the Pamirs and flows past Bokhara and Khiva into the Aral Sea, and by the smaller Syr Daria, which, from its source in the Tian Shan Mountains, provides irrigation for Ferghana, Samarkand, and Tashkent.

Russian Turkestan was once a seat of Iranian-speaking civilization;[158] but since the sixth century A.D. it has been constantly overrun by invaders from different quarters. First the Turks subjugated the Iranian farmers, then the Chinese defeated the Turks and ruled the country for a century; then the Arabs, entering Turkestan by way of Persia, defeated the Chinese in 751 A.D., and remained in power until the thirteenth century, since which time, until the Russian conquest, Turkestan has been ruled by various bodies of Turks and by Mongols.

The present peoples of Russian Turkestan are numerous and varied, but may be divided into two principal groups, the Tajiks and the Turkish-speakers. The Tajiks, who number over a million in Russian Turkestan,

[158] This brief introduction is based largely on Jochelson's *Peoples of Asiatic Russia*, Chapter 4. See also, K. E. von Ujfalvy, *Les Aryens au Nord et au Sud de l'Hindou Kouch.*

have between one and two million brethren in Afghan territory. In the former country they inhabit the oases of Ferghana, Samarkand, and Bokhara, where they live as farmers marvelously skilled at irrigation; they are the linguistically unaltered descendants of the pre-Turkish cultivators. Their western geographical limit is the Bokhara country; there are no Tajiks in Khiva. On the plains the Tajiks proper form but a small proportion of the population, since many others have been absorbed into the Turkish ethnic world. Besides these plainsmen, there are many more in the mountains, who live in farming villages as a unified population reaching over the Pamirs into Afghanistan. These mountain people have presumably been less subjected to Turkish influences than have those of the plain.

The second principal ethnic and linguistic group, that of the Turkish-speakers, is divided into two principal and many minor subdivisions; the important ones are the Uzbegs and the Sarts. The Uzbegs are pastoral nomads linguistically related to the Kirghiz, who have settled down in considerable numbers during the last century. They are the descendants of a mixture of Turks, Mongols, and Iranians, whose principal ancestors were recruited from the Turkish tribes of northern Turkestan, and converted to Islam in the fourteenth century. They are the aristocrats of the country and the rulers of some of the city khanates have been drawn from their ranks.

The Sarts are assimilated Tajiks with the addition of considerable Turkish blood; they are farmers, townsmen, and traders, living in all of the oases west of Khiva. Other Turkish speakers are the Turkomans, particularly numerous in Khiva and on the plains to the west, Kipchaks, Kara Kalpaks or Black Hats, Tatars from Russia, and Turkish-speaking Moslems from Chinese Turkestan. There are also Mongol Kalmucks in Russian Turkestan in small numbers, Moslems, whereas their kinsmen elsewhere are Buddhists. A few thousand Arabs left over from the early Moslem conquest still remain, although most of them were absorbed by the Uzbegs. Persians, Hindus, Gypsies, and an ancient colony of Jews, centered at Bokhara, make up the rest of the non-Russian population.

The Uzbegs, who as partial whites concern us here in only a collateral sense, are hardly sufficiently unified in race to be dealt with as a single body.[159] Many of them are purely or nearly purely white, others are apparently pure Mongols, while the majority occupy positions in between. Nearly all are brachycephalic, for few long-headed elements have been absorbed into their body; many of them belong to that hybrid type, called Turanid by von Eickstedt,[160] and characterized by brachycephaly, convergent parietal walls, a nearly straight beard of medium abundance, a

[159] Vishnevsky, B. N., **ACIA**, 3me sess., 1927, pp. 243–248.

[160] See Chapter VIII, section 6, p. 287.

long, broad face, a low-rooted, long, and often convex-profiled nose, with a high-orbitted but heavy-lidded eye. The Sarts are also a variable group, but are much less mongoloid on the whole than the Uzbegs, and in many cases are identical with the Tajiks.

Since the Tajiks form the basis of the population of Russian Turkestan as well as of the mountains to the south, and since all other elements in the population are known and have been described, our only concern here is the elucidation of the racial position of the Tajiks. This is a comparatively easy task.[161] The Tajiks are of moderate stature, with a mean of 166 cm., the same in the oases of Samarkand and Ferghana, in the foothill country of Ura-Tuba and Pedjerent, and in the mountains, lying between the headwaters of the Syr Daria and those of the Amu Daria, in Afghanistan. Their arm length and arm segment proportions show them to resemble closely southern Germans and Frenchmen, in other words Alpines; at the same time they differ profoundly in these respects from mongoloids. In shoulder breadth, and in an especially great pelvic width, they again show their lateral constitutional tendency, and their Alpine body build.

The dimensions and proportions of the heads and faces of the Tajiks as a whole are as ideally Alpine as one can find in any unsorted population series; they might equally well have been measured upon samples from the most purely Alpine districts of France or Bavaria. The head length mean is 180 mm., the head breadth 155 mm., the cephalic index, 86. The auricular height is 127 mm., and the series hypsicephalic. The minimum frontal is 107 mm., the bizygomatic, 141 mm., and the bigonial, 108 mm.; the face height, 124 mm., the nose height, 55 mm., and the nose breadth, 34. The facial index is 88, on the border between mesoprosopy and leptoprosopy; the nasal index, 65.

On the whole, the mountaineers and the people of Ura-Tuba and Pedjerent are the same, but the oasis-dwellers of Samarkand are narrower-headed, narrower-faced, and narrower-nosed, while at the same time wider in the distance between the eyes, with a cephalic index of 84, and a nasal index of 62. Another difference between the Samarkand series and the mountaineers is in the biorbital diameter, taken between the outer eye corners; 94 mm. in Samarkand, and 92 mm. in the others. At the same time, the interorbital distance, between the inner corners, is actually narrower in the Samarkand group (30.7 mm.) than in the mountains (34.5 mm.). Hence the divergence of the Samarkand people from the mountaineers cannot be in a mongoloid direction. The series from the

[161] Thanks to the generosity of Prof. Boris N. Vishnevsky, of the Institute of Anthropology and Ethnography at Leningrad, who has most graciously permitted me to make use of his fully documented series of over 300 Tajiks, hitherto published only in part and in a preliminary report.

Vishnevsky, B. N., **ACIA**, 3me sess., 1927, pp. 243–248.

oases of Ferghana differs from the mountain group in the same direction, but not to the same degree as that of the Samarkand Tajiks. This direction points, in a metrical sense, toward the Irano-Afghan Mediterranean type prevalent among the Turkomans, and also, as we shall see later, toward that of the Bokharan Jews.

The skin color of the Tajiks is a brunet-white to a light brown, from von Luschan #10 to #16; it is lighter on the plain than in the mountains. About 55 per cent have dark eyes, with a great majority of light brown; the remainder are mostly dark-mixed, of both blue-brown and green-brown shades. The plainsmen of Samarkand and Ferghana run to 85 per cent of dark eyes, with many dark browns. The head hair color is black in 35 per cent of the mountain group, and over 60 per cent in the oases; the rest are dark brown in both, except for a very small incidence of partial blondism. The beard color is the same as that of the head hair, as a rule, although there is a slight tendency to reddish brown.

The hair form is usually straight on the beard as well as on the head; the eyebrows are usually thick and concurrent. The beard development reaches a maximum white condition, with heavy growth on the cheek and jaw as well as on the mustache and chin. There is, however, a 10 per cent minority with weak development. Hair is also usual on the chest, abdomen, arms, and legs; 12 per cent even have it on their backs. In this maximum pilosity the mountaineers are outstanding; the Tajiks of Samarkand and Ferghana, while still very hairy, are less so.

Most of the Tajiks have pentagonoid or oval faces, the latter form being especially marked in the lowlands; the horizontal profile of the face, however, is flattish in over 50 per cent of the group, in marked contrast to the narrowness and beakiness of Turkomans and Persians. That this condition is Alpine rather than mongoloid is shown by the lack of forward malar projection.

The mountain Tajiks have noses that are definitely Alpine in most cases; the root is usually of medium depth, under moderate browridges; the bridge is medium to high, with oblique walls, the tip is of moderate thickness, often slightly bifurcated, and usually horizontal; the wings of medium lateral extension. Straight or wavy profiles are found among 60 per cent, convex among 25 per cent, concave among the rest. The noses of the oasis people, on the other hand, tend to high roots, lack of nasion depression, convex profiles, and compressed wings.

A few Tajiks have round nostrils, and others a horizontal nostril axis; these show definitely mongoloid tendencies, as do some 4 per cent with slight epicanthic eyefolds. Armenoid or Dinaric tendencies are more prevalent; some 17 per cent of occipital flattening is found in the total group, but it is more frequent on the lowlands than in the mountains,

where it reaches but 8 per cent. Lambdoid flattening is commoner. The great majority have curvoccipital, globular cranial vaults, with both high and broad foreheads which are rarely more than slightly sloping.

The mountain Tajiks, both metrically and morphologically, are as pure Alpines as it is possible to find anywhere in the white racial area today; but like other Alpines, they show a minor tendency toward a Dinaric or Armenoid form, owing to the presence of Mediterranean strains in their midst. The Nordic racial element which the bearers of Iranian speech may have brought to this population has been almost entirely absorbed, although a few blonds, resembling those found among the Ossetes in the Caucasus, are to be seen. Mongoloid admixture is present in small quantity; most of the mongoloid racial characters are so at variance with those of the Tajiks that when present, mongoloid blood may easily be perceived.

On the plain, in the oases of Ferghana and at Samarkand, there is a strong admixture of narrow-headed, narrow-faced, thin-nosed, high-nosed, brunet Mediterraneans, of the general Irano-Afghan type. This divergence from the mountain Tajik type is at variance with the theory that mongoloids have mixed with the people of the oases. The acquisition of this Mediterranean strain may be explained by any one or more of the following theses: (a) admixture of Turkomans at the beginning of the Turkish invasion; (b) the absorption of Persian slaves; (c) the absorption of Jews; (d) the survival of an early Turkish strain in the oases from the days of initial food production, or of the beginnings of horse nomadism. Historically, any of the first three may or may not be possible; the fourth is rendered possible only by a tentative acceptance of the theory of Turkish origins propounded earlier in this volume.

How much farther eastward the zone of Alpine reëmergence goes beyond Russian Turkestan, cannot be told on the basis of available published data. If it extends beyond the Tian Shan, it has been so modified through mixture with mongoloids that its identification would be difficult. The Tajiks form the last complete outpost in the wide zone of Alpine survival or reëmergence which reaches eastward with few breaks from France over a stretch of nearly 5,000 miles. Like their counterparts in the far west, they are more Alpine and less altered by Mediterranean admixture than most of those who live in between.

(20) THE BRACHYCEPHALIZED JEWS: ASIA AND CENTRAL EUROPE[162]

Our study of the Alpine peoples and their mixed derivatives leads directly to that of the European and central Asiatic Jews, for their racial

[162] Here as in Chapter II, section 7, I wish to express my gratitude to Professor Harry Wolfson for elucidating the historical and cultural aspects of the Jewish racial problem.

history is an intimate part of the problem of Central European brachycephaly, and deserves treatment in that connection. At the same time, the Jews cannot be treated as a geographical unit; they are ubiquitous within certain economic and cultural horizons. Their distribution is definitely limited, but its limits are not fundamentally spatial. For this reason their racial character has been affected more by social and economic considerations than by latitude and longitude.

In Chapter XI, section 7, we have already surveyed the racial position of the Sephardic Jews, i.e., the descendants of the Jews expelled from Spain and Portugal in 1492, as well as of the Oriental Jews who live in the stretch of Mediterranean racial territory extending from Morocco to Iran. By means of this survey we have established the existence of a definite and very constant Jewish racial entity, variable within itself but varying equally in all geographical groups. This Jewish racial entity is almost purely Mediterranean, and is the result of the combining of several Mediterranean types in Palestine and elsewhere during the courses of Jewish history. Having established what appears to be the basic Jewish racial entity, our next step is to discover what alterations this entity has undergone in the course of the complex history of the Ashkenazic Jews in Europe and of the Oriental Jews living in parts of Asia other than those already studied.

Let us first study the Jews of Turkestan, who are descended from offshoots of the ancient Persian colony, and who were isolated from the rest of the Jewish world for several centuries before the Russian occupation of the central Asiatic khanates. These Jews have been made the subjects of an especially thorough study and merit detailed attention.[163]

In the first place, the Jews of Bokhara and Samakand are the same, and seem in turn to be identical with those living in Herat in Afghanistan. Thus these northeastern and eastern Jewish peoples who speak a Persian dialect form a single racial unit. They are of moderate stature, 166 cm., nearly the same as the Tajiks among whom they (the Bokharan Jews) have lived for over a millennium. They are narrower-shouldered than the Tajiks, shorter-trunked, and longer-legged; their bodily proportions preserve more of a Mediterranean racial character. Their heads are absolutely short, with a mean length of 180 mm.; narrower than those of the Tajiks, with a mean breadth of 153 mm., but fully brachycephalic, with a mean cephalic index of 85. Despite this brachycephalization they preserve distinctive traits in the diameters of the face; their minimum

[163] Weissenberg, S., **MAGW**, vol. 43, 1914, pp. 257–272.
Vishnevsky, B. N., **ACIA**, 3me sess., 1927, pp. 234–248.
Professor Vishnevsky has given me permission to use the detailed data of his Turkestan Jewish series, along with those of his Tajik series.

frontal mean is 104 mm., their bizygomatic, 139 mm., and bigonial, 104 mm. Thus they are definitely narrower in all three dimensions than their non-Jewish neighbors, are not much wider in the essential facial diameters than long-headed Jews. Their interorbital (31.3 mm.) and biorbital (90.9 mm.) diameters are narrower than those of other central Asiatic peoples; they have thus also preserved the original Jewish narrowness between the eyes. Their faces, with a mean length of 125.4 mm. are 2 mm. longer than those of their neighbors; their noses, with a mean length of 57 mm., also 2 mm. longer. Their facial index of 90.5 is leptoprosopic, their nasal index, 62, 3 to 4 points lower than those of the narrowest noses of the other peoples of Turkestan with whom they are in contact.

Metrically, therefore, it would be wrong to infer from the cephalic index alone that the Bokharan Jews were simply Judaized Tajiks, or Sarts, or Judaized Turkestan people in general; what they actually are is brachycephalized Jews, who have preserved their Mediterranean facial characters almost intact.

They are almost all brunet-white in skin color, lighter than the Tajiks as a whole; in eye color, 57 per cent are purely brunet, and mostly light brown, while of the mixed eyes, the great majority are dark-mixed. Fifty per cent have black head hair; 40 per cent, dark brown; and another 10 per cent, brown to blond. In their general pigment character they are approximately the same as the mountain Tajiks, but somewhat lighter than those of the oases. They are, however, as heavily bearded as the Tajiks, and as abundantly supplied with body hair.

They are mostly ellipsoid in facial form, and have much less malar projection than the Tajiks, in fact their malars are usually compressed, in great contrast to those of the partly mongoloid Sarts and Uzbegs. In their nose form their non-mongoloid and non-Alpine character is fully expressed; 44 per cent have convex profiles, 40 per cent straight, and 9 per cent wavy, while only 7 per cent are concave. The tip is depressed in 37 per cent of cases. To match the nasal convexity and tip depression is a 17 per cent ratio of occipital flattening, and a high incidence of small, slanting ears.

The observational material confirms the metrical data; the Jews of Russian Turkestan are true Palestinian Mediterraneans who have been brachycephalized by a process of Dinaricization; the agent of brachycephalization is Alpine, and undoubtedly the same as the Alpine element among the Tajik. The Turkish and Mongol invasions of Turkestan, which brought much mongoloid blood to the general population, have left the Jews almost unaffected. One case of epicanthus observed by Vishnevsky alone provides an exception.

If the endogamy of the Bokharan Jews has been sufficient to exclude

mongoloid influences almost entirely, it has also preserved a Jewish racial type since before the mongoloid arrival. The amount of Alpine infusion necessary to generate the brachycephalization of this people must have been slight. Some of it may, indeed, have been acquired in transit across northern Persia. The lesson taught by this particular study is that brachycephaly among Jews does not in itself imply the absence of a basic Palestinian racial character.

Let us continue our study of brachycephalized Oriental Jews who live in various geographical units derived from different Jewish sources. The Jews of Asia Minor are descendants of the Byzantine Jews, reënforced by many Sephardim. In Kurdistan there is a very old settlement of Aramaic-speaking Jews, who have no rabbis but who worship the tombs of prophets, and who live with the Kurds symbiotically as traders and makers of jewelry for the Kurdish women. In the Caucasus there are Jewish settlements dating back, according to local tradition, to Assyrian times, but historically these settlements were first mentioned in the fifth century A.D., and the Jews who composed them were said to have come from Persia. The main Jewish section of the Caucasus is Daghestan, in Lesghian country; the Jews here, numerous in the time of the Khazars, are now scattered in a few mountain villages, and speak the same Persian dialect as do the Tats. Another group of Jews, known as Georgian Jews, lives in Georgia, especially in Tiflis.

In the Crimea there are still settlements of Karaite Jews, who speak the Jagatai Turkish of the Khazars, as do the Krimchaks, but the latter are rabbinical whereas the Karaites are not, and the Krimchaks have absorbed Jews from Italy. Some of the Karaites are found in small colonies in Poland and Lithuania, as well as in the Crimea.

The Jews of the Caucasus [164] including the mountain Jews of Daghestan, the Georgian Jews, and the Shemakha Jews who live in Azerbaijan, are highly brachycephalic. Metrically, samples of all these groups are much alike, with mean statures ranging from 163 to 166 cm., and cephalic indices of 85 and 86. They are all predominantly brunet, and have straight or convex nasal profiles. Their faces are of medium length (125 mm.), and broader than those of the Bokharan Jews (141 mm. ca.). They are, however, still extremely leptorrhine, with nasal indices of 59 to 63. The general racial character is Dinaric, with more Alpine mixed with the original Jewish Mediterranean strains than in Turkestan. It is a mistake to call them Armenoid, for their faces and noses do not approach those of the Armenians in either length or breadth. Any Armenian can

[164] Chantre, E., *Récherches anthropologiques dans l'Asie Occidentale.*
Dzhavakhov, A. N., **RAJ**, vol. 8, 1912, pp. 57–75.
Weissenberg, S., **AFA**, ns. vol. 10, 1911, pp. 233–239.

distinguish with ease between a fellow Armenian and a Jew, and the distinction is substantiated metrically.

Little difference may be found between the Karaite Jews of the Crimea,[165] whose relatives contributed a small but renowned element to the composition of the European Ashkenazim body, and those of the Caucasus. The mean stature of the Karaites is 164.5 cm., their mean cephalic index 85, their nasal index 60; 75 per cent of them are brunet, but 5 per cent are light or prevailingly light in complexion. Their facial dimensions are the same as those of the Caucasus Jews, and the same conclusions drawn in regard to the latter apply to the Karaites.

Karaites living outside of the Crimea, however, have failed to preserve their characteristic metrical position. Those settled in the Egyptian Delta[166] have a mean cephalic index of 74.6 and are little different from other Egyptian Jews, while Karaites of Lithuania[167] have a mean cephalic index of 81, a stature of 162 cm., and 55 per cent of fair skin color and an equal amount of mixed eye hues. Over 40 per cent have also brown or light brown hair color. Concave noses, the antithesis of a Jewish condition, are found among 50 per cent, while nasal convexity is almost entirely absent. The Lithuanian Karaites have apparently been thoroughly mixed with Neo-Danubian peoples either locally or in transit; their stature level is very low, but this may be accounted for environmentally. On the basis of available data, there is little to connect the Lithuanian Karaites with those of the Crimea, except their retention of brunet pigmentation in nearly half the group. However, further data than is now available would be needed to make this conclusion certain.

Having reviewed the racial characters of the rest of the Jews in Europe, North Africa, and Asia, insofar as available data have permitted, we are now faced with the task of studying the Ashkenazim. These modern central European Jews, concentrated in the Ukraine, White Russia, northern Rumania, Galicia, Poland in general, Lithuania, Germany, Bohemia, and Austria, have been subjected to considerable study, especially those living in Poland and Lithuania and the countries to the east.[168]

[165] Weissenberg, S., **AFA,** vol. 34, 1907, pp. 219–220.

[166] Weissenberg, S., **MAGW,** vol. 42, 1912, pp. 85–102.

[167] Talko-Hryncewicz, J., **MAAE,** vol. 7, 1904, pp. 44–100.

[168] Fishberg, M., **ANYA,** vol. 16, part 2, 1905, pp. 155–297 is the most exhaustive single treatise, and contains a bibliography of previous works.

Other works used in the present study include:

Beddoe, J., **TESL,** vol. 1, part 2, 1861, pp. 222–237.

Davenport, C., and Love, A., *Army Anthropometry.*

Deckert, E., **ZFE,** vol. 9, 1877, pp. 39–41.

Dubowski, W., Résumé in **AFA,** vol. 14, 1883, pp. 61–71.

Fligier, C., **MAGW,** vol. 9, 1880, pp. 155–157.

(*Continued* on page 643.)

These studies, especially that of Fishberg, show a number of important points clearly. One is that the Jews as a whole, without regard to specific political divisions, form an ethnic community with as much statistical homogeneity as do most ethnic groups which have elsewhere been treated as units. Although varied in racial origin and varied individually, in the racial characters measured, the usual distribution pattern is an approximation to a bell-shaped curve. The Ashkenazim of eastern Europe, at least, form a biological unit. This is only to be expected when one considers the spatial mobility of the Jews in history, and, by contrast, their endogamy within the larger religious community.

Another is that stature among the Ashkenazim is environmentally and socially conditioned to a large extent, and geographically variable in a much lesser degree. Mean statures for regional groups vary from 162 cm. to 167 cm., with a general mean around the figure 164 cm. In a rough way, the stature level corresponds to that of the local Gentiles, but is one or two centimeters lower in each region. In England, where the Jews have enjoyed relatively favorable living conditions, and in America among the American born Jews, the stature rises to high levels. In Europe, indoor workers such as tailors and shoemakers have the smallest statures, professional men the tallest; the occupational range is from 160 cm. to over 170 cm. Since the mean stature of the Palestinian Jews was at least 166 cm. in the days before the Diaspora, and since the purely Jewish element in the modern Jewish body must almost everywhere be potentially as tall as that of the Gentiles among whom they live, if not taller, the short stature of eastern European Jews as a whole is, therefore, entirely a reflection of environmental and occupational forces. Their rapid size increase on American soil, in response to better living conditions and perhaps also to a relief from a constant nervous tension, may be partly interpreted

Guthe, C., **AJPA,** vol. 1, 1918, pp. 213–223.
Himmel, H., **MAGW,** vol. 18, 1888, pp. 83–84.
Hrdlička, A., *The Old Americans.*
Jacobs, J., **JRAI,** vol. 15, 1886, pp. 23–62.
Lempertowna, G., **Kosmos,** vol. 52, 1927, pp. 782–819.
Lipiec, M., **MAGW,** vol. 42, 1912, pp. 115–195; **ACIA,** 2me sess., 1926.
Kossovitch, N., and Benoit, F., **RDAP,** vol. 42, 1932, pp. 99–125.
Majer, J., and Kopernicki, I., **ZWAK,** vol. 9, 1885, pp. 1–92.
Pantuchow, J. J., **PRAO,** vol. 1, 1888, pp. 26–30; Résumé in **AFA,** vol. 26, 1899, pp. 211–213.
Pittard, E., *Les Peuples des Balkans.*
Rutkowski, L., **MAAE,** vol. 2, 1910, pp. 65–121.
Saller, K., **ZFMA,** vol. 32, 1933, pp. 125–131.
Talko-Hryncewicz, J., **ZWAK,** vol. 16, 1892; Résumé in **MAGW,** vol. 21, 1891, p. 63.
Weissenberg, S., **AFA,** vol. 23, 1894–95, pp. 347–423, 531–579; **ZFE,** vol. 44, 1912, pp. 269–274.
Wiazemsky, Prince, **Anth,** vol. 22, 1911, pp. 197–201.

as a fulfilment of their genetic possibilities and cannot necessarily be claimed as something entirely new. In the same sense, the inferior chest diameters of the East European Jews, once considered a racial character, are seen to rise to the non-Jewish standard in America.

The head form of the Ashkenazim is relatively constant within the regions of maximum Jewish concentration; in Germany the mean cephalic index for Jews is about 81, rising to 83.5 in Baden; in Galicia again it reaches the level of Baden, and in Bukovina attains 84, but elsewhere, from Austria to the Ukraine and Lithuania, it centers about the mean of 82. There is a slight tendency for the cephalic index level to vary regionally as does that of the corresponding Gentiles, but this tendency is neither strong nor wholly consistent. It is chiefly manifest in the relatively high indices in Galicia and Bukovina. Everywhere in central and eastern Europe, except in comparatively long-headed regions such as Moldavia, the Jews are less brachycephalic than the Gentiles. The central European Jews have been only partly brachycephalized, less so than the Christians, and in view of their wide geographical spread, have maintained a remarkable racial continuity in head form.

A third consideration, that of pigmentation, is found to agree in principle with stature and with head form; the Jews are mainly brunet, with about 55 per cent of dark hair and eye color combinations, and less than 10 per cent which can be construed as blond. In countries where the Gentiles are predominantly blond, or more blond than brunet, the Jews are relatively dark; in countries such as Rumania where the Gentiles are prevailingly brunet, the Jews are blonder than the Gentiles. The Jews have, therefore, struck a pigment balance which is as constant as their balance in head form.

In the dimensions of the head and face, the Jews have likewise developed certain consistencies which operate regardless of geography. The head length is always, except in socially selected groups, less than 190 mm., and often less than 185 mm. The bizygomatic is less than 140 mm., with the same exceptions, and usually stands at the level of 135 mm. or 136 mm., and the nose breadth mean ranges usually between 34 and 36 mm. The vertical diameters of the face and nose are, in existing material, seldom reliable, but there is reason to believe that the upper face height is relatively long in reference to the total face height, which is a Mediterranean racial character. Convexity of the nose, a popular diagnostic of Jews, is usually found in far fewer than 50 per cent; straight noses are in all regional Jewish groups the commonest of profile forms, while, in southern Russia, concave profiles are more frequent than convex.

The physical composition of the central European Jewish body has not been difficult to determine. The Ashkenazim are a reasonably uniform people in a statistical sense; furthermore, many of their metrical characters,

as far as we know them, are not markedly different from those of their Mediterranean Jewish ancestors. The facial diameters, for example, relate them closely to the Mediterranean prototype, in strong contrast to the broader faces of the Alpines and Neo-Danubians among whom most of them live. The head form, on the other hand, shows a partial brachycephalization which must be due to the absorption of Gentile blood. At the same time the presence of a strong minority with mixed or light pigmentation makes such an absorption necessary. The Jews are not simply Judaized central Europeans; they are central-Europeanized Jews.

It has been remarked by some anthropologists that the Jews look "Armenoid," and that this Armenoid appearance must be due either to Hittite admixture or to a sojourn in Asia Minor before their arrival in Europe. This remark implies a misunderstanding of Jewish history as well as of the nature of the Armenoid race. Many Ashkenazic Jews, it is true, possess the combination of a brachycephalic head with a narrow face and convex nose, but there is not enough Alpine in the Jewish body to make this Dinaricization prevalent or standard. It is found among blond as well as brunet Jews, and is an individual rather than a group phenomenon.

Individual central European Jews vary greatly in facial and cranial appearance. Among them may be picked out without trouble apparently pure Palestinian types; the convex-nosed, long-faced sub-type, which is frequently found among Sephardim, and is especially known to the world through the faces of Disraeli and Lord Reading in England, is on the whole rare among Ashkenazim; the straight-nosed, more typically Mediterranean form, such as is represented by the actors Al Jolson and Eddie Cantor, is much commoner. Leon Trotsky represents a brachycephalic, Dinaricized Jewish type, and Albert Einstein is a good example of another.

Among Russian Jews it is not difficult to select individuals with large malars, broad, snubbed noses, and high alveolar segments of the upper face, who are as nearly mongoloid as many Volga Finns. Among German Jews may be found individuals who are to all purposes Nordic, and others who belong to the Borreby race, which is the most numerous single type among Gentiles in Germany. Alpine Jews are commoner than the incidence of Alpines in central and eastern Europe would perhaps warrant, and some of their Alpinism must have been derived from their sojourn in France and in the Rhinelands before their march eastward across central Europe.

On historical grounds it is very likely that the ancestors of the Ashkenazim mixed more with Gentiles in western Europe, before the time of the first Crusade, than their more recent forebears have in Slavic countries. The heavy beard growth, the abundance of the body hair, and the wavy

hair form of many brachycephalic Jews imply a French or German Alpine infusion rather than any racial increment which they could have assimilated in Slavic countries. The racial contribution of the western Jews to the Ashkenazic body seems to have been far greater than that of their Byzantine and Crimean colleagues.

Although all of the racial types enumerated above, and, in fact, every racial type known in Europe, may be picked out of the Jewish body, most of the Jews represent a blend in one way or other of several of them, and most of them, for one reason or another, look Jewish.[169] There can be no doubt that the original Mediterranean blend of Palestine is the most important. If one were to hazard a guess, one might suggest that it actually accounted for more than half of the whole; that it is strongest in Poland, and weakest in Germany. As with the Bokharan Jews, its most persistent metrical features in mixture are to be found in the facial dimensions. A careful study of the soft parts of the nose might reveal further persistences, but there are apparently no corresponding peculiarities of the facial skeleton.[170]

The central European Jews have lived in central Europe since the beginning of the period when the Germans and Slavs began to grow brachycephalic. Their recent racial history has, therefore, run parallel in time to that of their Gentile neighbors, in comparison with whom they must have remained relatively constant. The racial character of the South Germans, of the Poles, and of the Russians, has changed much more during the last millennium than has that of the Jews. The modifications which the latter have undergone in one generation in America are as great in some respects as those which have affected their ancestors in twenty.[171]

(21) CONCLUSIONS

The conclusions to this chapter have been partly anticipated in the introduction; an elaborate résumé is unnecessary here. There are, however, several matters which have been brought to light by the survey which has just been completed, and which were not fully anticipated.

In the first place, the geographical extent of the Alpine racial type is enormous, reaching from France to China. Throughout this extent it maintains a nearly constant form, in stature, in the dimensions of the head and face, in pilosity, and in general morphological features. Its wide milieu suggests that its presence in Europe is merely an extension of its

[169] See Chapter XI, section 7, pp. 441–442.

[170] Matiegka, J., **AnthPr**, vol. 4, 1926, pp. 163–219.

[171] For the question of changes in American Jews, see Boas, F., **ZFE**, vol. 45, 1913, pp. 1–22, and also, Morant, G. M., and Samson, O., **Biometrika**, vol. 28, 1936, pp. 1–31.

original range, for it could not have gone from Europe to Turkestan. If, as has been assumed for the purposes of this book, it was originally a part of the racial complex of the Upper Palaeolithic hunters of Late Pleistocene Europe and North Africa, then the former spatial extent of the cultures in which these hunters participated must reach far into Asia.

The same forces, furthermore, which derived the Alpine from the larger-bodied and less infantile Upper Palaeolithic group as a whole must have operated across the entire zone now occupied by Alpines. The consistency of the Alpines in this zone is clear; what is more difficult to explain than this consistency is the failure of the northwestern European relatives of the Alpines to undergo a similar reduction. The difference in pigmentation between various Alpine groups, and between Alpines and the unreduced Palaeolithic survivors, is of little importance; we have seen that the white racial stock is extraordinarily fluid in regard to pigment changes.

The second phenomenon revealed by our study is the fact that when Mediterranean racial types are blended in a two to one proportion with Alpines, something totally different from either results, and this product is not in all characters intermediate. The facial breadths are Mediterranean, the nose and face are often elongated, the cranial length reduced to an Alpine dimension, and the breadth similarly increased; at the same time the foramen magnum and the auricular passages retain a metrical position in reference to the anterior landmarks of the cranial and facial skeleton found in the Mediterranean ancestor. The occipital region undergoes a certain degree of flattening, and the nasal bridge, in harmony with this motivation from the rear, becomes prominent. The process described above is one of Dinaricization, and the hybrid types produced by this principle are Dinarics and Armenoids.

There are more Dinarics and Armenoids in the world than there are Alpines; this is due to historical reasons. When the food producers entered the territory formerly occupied by Upper Palaeolithic hunters, the former were much more numerous than the latter, who either retired to environmental pockets economically unfavorable to the food producers, or were absorbed into the ethnic corpus of the latter. The adjustment of the earlier population element to the new conditions and their reëmergence through the Mediterranean group made a combination of the two basic racial elements in a genetic sense necessary. Thus the majority of Europeans are actually permanently blended, secondary hybrids between the old and the new; pure Mediterranean populations and individuals who are purely Mediterranean from the genetic as well as the anthropometric standpoint, are to be found only outside of Europe, except for the Iberian peninsula and the western Mediterranean islands. At the same time and in the

same strict sense pure Upper Palaeolithic survivors, themselves initially hybrids, are probably not to be found at all in Europe, although many individuals who may recapitulate Upper Palaeolithic man of different varieties, with considerable fidelity, are to be seen.

This survey of the living Europeans which we have just finished simplifies the whole white racial problem enormously; it reduces the white race to two least common denominators, the Mediterranean and the Upper Palaeolithic group, which in turn means Mediterranean and Mediterranean-Neanderthaloid in the widest sense. This simplification must not be accepted without caution; the Neanderthaloid hybrid hypothesis seems most reasonable in view of present evidence, but that evidence, while clear in implication, is small in quantity. Furthermore this simplification, if tentatively accepted, must not be overworked. The two basic stocks which it postulates are each enormously varied and the white races and sub-races which have resulted from their conjunction are also numerous. Without a wholesale judgment of Solomon all whites cannot be divided simply into two groups, any more than they could, in accordance with Ripley's simplification, into three.

Chapter XIII

CONCLUSION

(1) COMMENTS AND REFLECTIONS

Since the classification of the subdivisions of the white race has already been given in Chapter VIII, it seems unnecessary to review it here; the second part of the book has been summarized in advance. The work as a whole is an attempt to deal with the materials of physical anthropology in terms of archaeology and of history, in recognition of the facts that the human body is one unit in a social group of bodies and cannot be studied profitably out of its biological and social context. Furthermore, it cannot be studied with more than indifferent profit in the flat two-dimensional plane of the present; reference must be had to the past, and thoughts may be legitimately entertained as to the future.

It has been borne home to me, in the perusal of the body of anthropometric literature concerning the living members of the white race, that one good, accurately measured study of a few hundred men, which includes all of the more important measurements permitted by the Monaco agreement and specified by Rudolf Martin, as well as a large number of accurately taken morphological observations, is better than a general survey of a few characters on a million. Studies of this nature have so far been made principally by Americans, Norwegians, Germans, Austrians, and Russians. In tribute to the volume and accuracy of their observational data, it is my feeling that we anthropometrists of the rest of the world must take off our hats to our colleagues in Moscow. Their activities in both the European and the Asiatic portions of their country have been extremely productive and have served to cast much light upon the definition of the mongoloid race, and upon the racial history of the Uralic- and Altaic-speaking peoples. For a systematic investigation of their own people, the palm is divided between Norway and Germany; in the latter case it goes especially to the editors and authors of the *Deutsche Rassenkunde*.

For many years physical anthropologists have found it more amusing to travel to distant lands and to measure small remnants of little known or romantic peoples than to tackle the drudgery of a systematic study of their own compatriots. For that reason the sections in the present book which deal with the Lapps, the Arabs, the Berbers, the Tajiks, and the Ghegs may appear more fully and more lucidly treated than those which deal with the French, the Hungarians, the Czechs, or the English. What

is needed more than anything else in this respect is a thoroughgoing study of the inhabitants of the principal and most powerful nations of Europe.

Much more badly needed, however, than data on the living is the publication of skeletal material of all cultural periods in European prehistory and history. European museums and private collections abound with skulls and long bones, only a small proportion of which have as yet been made available through the literature. Most of these are of Neolithic or later date; when a skull of alleged or real glacial age is discovered, it is, as a rule, soon published.

In the reconstruction of the racial history of the white race which appears in the preceding chapters, the reader may readily discover that there are many weak places and gaps, which have been bridged by the use of far too little data. This has been done intentionally, so that the picture may appear as a whole, and so that a logical, if hypothetical, scheme may be devised. It is inevitable that between the writing and the printing of this sentence, some of these gaps will have been filled by the discovery or collection of new data, and that some of the reconstructions will be proved false, while others, we hope, may perhaps be confirmed. He who offers a scheme explaining the totality of anything must be bold or his scheme is useless; he must not, above all, be afraid of exposure. The theorizers of one generation furnish pleasure to the fact finders of the next, by giving them something to tear down, and by daring to be wrong.

Before a second edition of this book is written, or other books compiled to disprove or replace it, it is my sincere wish that more light will be shed by the fraternity of diggers and measurers upon at least the following problems: (a) the skeletal history of the Mediterranean race in pre-food-producing times; (b) the unveiling of that great European mystery, the Mesolithic; (c) the origin and history of the Alpines; (d) the same for the Corded people; (e) the same for the bearers of the Megalithic culture into the western Mediterranean and northwestern Europe. There are many other weak spots in our fabric, but these seem, to me at least, to be the weakest.

(2) THE WHITE RACE AND THE NEW WORLD

Since the recession of the last glacier, the principal movement of the white race has been northward and westward, until the center of population and of civilization has shifted from Africa and Asia to southern Europe, and from southern Europe to the northwest. From roughly 3000 B.C. until 1492 A.D., the various branches of the Mediterranean race which had followed the rain belts into Europe were busy expanding in the countries which they had settled, and in assimilating the stray remnants of the older hunting population, which they had absorbed.

Before 1492 A.D., for at least five centuries, the racial history of many parts of Europe consisted of an internal genetic adjustment, in the process of which the Mediterranean strains, so much more numerous at the time of their settlement in Europe than the total of the aborigines, were to a certain extent bred out and replaced by a reëmergence of the old types, and to a larger extent recombined genetically with the old types in reemergence to produce something new. Even within the Mediterranean stock, different strains in one population have showed differential survival values and often one has reëmerged at the expense of others.

In 1492 A.D., the maximum survival of Mediterraneans (in the widest sense) in Europe in the face of these reëmergences was to be found in peripheral countries; Spain, Portugal, England, the Netherlands, Sweden, and parts of Norway. It was precisely these countries, especially Spain, Portugal, England, and the Netherlands, which furnished the materials for the initial peopling by Europeans of the New World, and to the New World in the sense of the two Americas were soon to be added South Africa, Australia, and New Zealand.

The Mediterraneans who peopled the New World were of two principal varieties, Nordics and small, or Ibero-Insular (in Deniker's sense), Mediterraneans. The Nordics went to North America, South Africa, Australia, and New Zealand, the Mediterraneans proper to Central and South America. Wherever the Nordics went, they found lands occupied by scattered tribes of hunters and gatherers, or of river-side agriculturalists who were too few to offer them successful resistance. The wars with the Blackfeet and the Sioux were long and bloody, but the Blackfeet and the Sioux have lost their racial hold on their land as completely as have the Arunta. Dispossession and gradual extinction has been the fate of those who opposed the English and the Dutch, whether their opponents were Bushmen or Tasmanians or Beothuks.

The Spanish, on the other hand, went mostly to countries where a dense native population lived close to the soil, and where mighty empires had already arisen; their colonization was largely a matter of conquest and subjugation, and in all the American countries of Spanish settlement, excepting Argentina and Chile, the Indian farmer has reëmerged, and the Spaniard forms but an upper crust. The Portuguese, carving out, in Brazil, a vast empire of river and forest, found but little land suitable for the habitation of whites, and into this they brought black men from Africa whose descendants are now the chief possessors of the soil.

The expansion of the Mediterraneans, using the word in the larger sense, into the New World, was an extension of their earlier expansion into Europe. North America became, by the nineteenth century, the greatest Nordic reservoir in the world. But the century which saw the erection

of this reservoir also witnessed the beginnings of its change in character; the tide of immigration brought with it members of all the other races of Europe. The people who came to America, from the time of the Pilgrim Fathers to the imposition of the laws restricting immigration, were selected; none were fully representative of the countries from which they came. In America they were subjected to environmental forces of a new and stimulating nature, so that changes in growth such as their ancestors had not felt for centuries produced strange, gangling creatures of their children. In America we have before our eyes the rapid action of race-building forces; if we wish to understand the principles which have motivated the racial history of the Old World, it behooves us to pay careful attention to the New.

APPENDICES

Appendix I

MEANS OF PRINCIPAL CRANIAL SERIES USED IN CHAPTERS II–VII

Series	*Author*	*Page*	*Footnote*
1. European Upper Palaeolithic	Morant	30	21
2. Afalou bou Rummel, Algeria	Boule, Vallois, Verneau	40	44
3. Téviec, Brittany	Boule, Vallois	65	18
4. Al 'Ubaid, Sumeria	Keith	87	8
5. Kish A-Graves, Sumeria	Buxton	88	9
6. Naqada, Predynastic Egypt	Fawcett, (Morant)	95	21
7. Upper Egypt, 6–12th Dynasties	Randall, Mac-Iver, (Morant)	96	22
8. Lower Egypt, 26–30th Dynasties	Morant	96	22
9. La Solana, Spain	Hoyos Sainz, Barras de Aragon	100	32
10. Ticuso, Spain	Barras de Aragon, Verneau	100	33
11. Danubian Neolithic	composite	105 106	47 48
12. Corded, Bohemia and Silesia	Reche, Stocky	107	50
13. English and Scottish Neolithic	Morant	110	57
14. Chamblandes, Switzerland	Schenk	115	70
15. L'homme Mort, France	Wallis	116	74
16. Beaumes Chaudes	Topinard (von Bonin)	117	76
17. Neolithic Brachycephals, Belgium	composite	118	80
18. Swedish Neolithic dolichocephals (C. I. = x − 77.9)	Retzius, Fürst	123	88
19. Swedish Neolithic brachycephals (C. I. = 78 − x)	Retzius, Fürst	123	88
20. Bronze Age, Cyprus	Fürst, Buxton	138	11
21. Bell Beaker, Wörms	Bartels	156	62

Series	*Author*	*Page*	*Footnote*
22. British Bronze Age, planoccipital brachycephals	Davis, Thurman	159	—
23. Same, curvoccipital brachycephals	Davis, Thurman	159	—
24. Same, Corded type dolichocephals	Davis, Thurman	159	—
25. Scottish Bronze Age	Reid, Morant	160	67
26. Irish Bronze Age	composite	161	70
27. Aunjetitz, Lower Austria and Moravia	Szombathy	163	74
28. Aunjetitz, Bohemia	Stocky	164	76
29. Aunjetitz, Bohemia	Hellich	164	77
30. Esthonian Bronze Age	Friedenthal	167	90
31. Minussinsk, Siberia	Goroshchenko	169	97
32. Austrian Hallstatt	composite	182	16
33. La Tène, Bohemia	Hellich	189	30
34. Gallo-Roman, Marne	Wallis	190	35
35. British Iron Age	Morant	191	39
36. Irish Iron Age and Early Christian	composite	191	—
37. Scythians	Doniči	199	57
38. Armenian Iron Age	Bunak	201	67
39. Danish Iron Age	Nielsen	203	71
40. Swedish Iron Age	Retzius, Fürst	204	72
41. Norwegian Iron Age	Schreiner	204	73
42. Hannover Germans	Hauschild	207	78
43. Anglo-Saxons, London Museum	Morant; Brash,	207	79
	Layard, Young	209	82
44. Bajuvars, Reihengräber	Wallis	211	89
45. Merovingians	Wallis	215	99
46. Old Slavic, Poland	Majewski	218	103
47. Old Slavic, Wends	Asmus	219	104
48. Old Slavic, Bohemia	Matiegka	219	106
49. Anan'ino, Early Finnic	Debetz	224	4
50. Polom, 9th Century Finnic	Debetz	225	6
51. Avars, Margarethen am Moos, Hungary	Lebzelter	230	9
52. Jutas, Hungary	Bartucz	232	14
53. Tiszaderz, Hungary	Bartucz	232	15

	1		2		3		4		5		6	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	—	—	14	1662.	6	1561.0	—	—	—	—	88	1381.0
Horizontal Circumference	14	549.1	19	546.5	—	—	—	—	13	525.4	118	511.0
Maximum Length	20	198.1	23	193 ca.	6	184.8	6	192.8	25	189.5	139	185.1
Maximum Breadth	18	142.2	23	145 ca.	6	140.7	6	140.1	25	137.4	139	134.9
Basion-Bregma Height	9	135.8	13	141 ca.	*	138.6	4	136.5	9	132.7	134	135.2
Minimum Frontal Diameter	24	98.6	*	99.8	*	99.3	7	97.0	26	94.7	140	91.1
Bizygomatic Diameter	9	142.8	*	141.6		137.8	5	127.6	7	125.3	53	125.6
Bigonial Diameter	—	—	12	109.8	7	91.7	6	98.6	8	92.4	—	—
Total Face Height	—	—	*	121.6		116.6	6	118.1	—	—	—	—
Upper Face Height	11	71.4	22	70.0[a]		67.8	5	72.0	3	75.3	85	67.6
Nose Height	12	53.0	21	52.7	—	—	6	54.0	—	—	91	48.9
Nose Breadth	14	25.9	21	28.4	—	—	6	25.7	—	—	86	25.1
Orbital Breadth	12	44.5	22	41.8	—	—	7	40.0	5	43.4	—	—
Orbital Height	12	30.8	22	31.0	—	—	4	33.6	8	33.9	—	—
Cranial Index	18	72.6	22	74.8	6	74.3	6	72.6	24	71.5	130	73.0
Length-Height Index	8	69.4	*	75 ca.	6	75.0	4	71.2	8	72.1	131	73.3
Breadth-Height Index	*	95.5	*	97 ca.	*	98.6	4	98.3	7	96.7	131	100.5
Facial Index	—	—	*	85.9		84.6	5	92.4	—	—	—	—
Upper Facial Index	*	50.0	*	49.4		49.2	4	56.3	*	(60.0)	*	53.8
Orbital Index	12	69.0	20	73.0		71.9	3	82.5	8	81.6	—	—
Nasal Index	11	49.5	20	53.1		51.3	5	47.7	—	—	77	51.1

* = Means computed by division or multiplication of other component means.
Double rules indicate divisions between chapters.

[a] Corrected for tooth evulsion.

	7		8		9		10		11		12	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No	Mean	No.	Mean
Cubic Capacity (in c. c.)	—	—	—	—	—	—	—	—	—	—	—	—
Horizontal Circumference	—	—	—	—	8	527.9	7	519.6	21	519.3	23	522.2
Maximum Length	175	182.5	895	185.3	8	187.5	8	185.0	24	185.5	29	192.4
Maximum Breadth	173	134.3	896	138.9	7	140.3	9	134.0	23	136.7	26	133.8
Basion-Bregma Height	171	134.8	884	132.4	5	135.8	6	138.8	14	139.3	18	142.6
Minimum Frontal Diameter	101	92.6	935	94.8	8	95.4	8	94.6	22	96.4	3	94.7
Bizygomatic Diameter	157	124.5	785	128.7	—	—	—	—	7	129.9	—	—
Bigonial Diameter	—	—	—	—	—	—	—	—	8	93.6	—	—
Total Face Height	—	—	—	—	—	—	—	—	7	115.8	—	—
Upper Face Height	169	69.9	—	—	5	69.5	5	71.2	9	68.0	—	—
Nose Height	168	51.2	895	51.5	6	50.5	5	53.0	8	49.9	—	—
Nose Breadth	167	25.8	893	24.4	6	23.7	5	25.2	7	25.3	—	—
Orbital Breadth	—	—	886	38.4	6	40.7	5	40.2	—	—	—	—
Orbital Height	—	—	888	33.7	6	32.0	5	34.0	—	—	—	—
Cranial Index	173	73.6	884	75.1	6	75.1	8	74.1	24	73.6	34	70.9
Length-Height Index	171	73.9	884	71.5	3	71.8	5	74.0	14	74.6	20	74.3
Breadth-Height Index	*	100.4	*	94.6	3	95.7	6	98.4	11	100.4	19	106.7
Facial Index	—	—	—	—	—	—	—	—	10	87.8	10	93.9
Upper Facial Index	*	56.1	—	—	3	53.6	3	55.5	13	51.9	19	54.0
Orbital Index	—	—	886	87.8	6	77.8	5	84.6	9	79.5	—	—
Nasal Index	167	50.4	893	47.4	6	47.0	5	47.8	13	54.7	24	46.1

	13		14		15		16		17		18	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	25	1533.2	6	1525.2	19	1606.	—	—	5	1573.	—	—
Horizontal Circumference	106	536.6	6	519.3	—	—	—	—	9	515.9	12	527.2
Maximum Length	53	193.7	10	182.3	19	190.	21	195.0	10	176.4	14	190.7
Maximum Breadth	128	138.9	10	137.7	19	136.	21	141.0	10	143.7	14	138.7
Basion-Bregma Height	25	135.5	6	133.6	19	131.	13	140.0	7	129.7	9	137.6
Minimum Frontal Diameter	41	98.7	8	97.9	19	93.	18	98.6	9	96.1	13	99.7
Bizygomatic Diameter	41	130.4	6	129.5	19	129.	11	132.5	—	—	7	128.5
Bigonial Diameter	—	—	7	97.0	—	—	—	—	—	—	—	—
Total Face Height	16	113.3[b]	—	—	—	—	—	—	—	—	3	118.3
Upper Face Height	32	70.8	6	68.5	—	—		78.2(?)	—	—	8	69.1
Nose Height	15	50.6	6	48.5	—	—		56.8	3	47.0	8	50.5
Nose Breadth	34	23.6	6	23.8	—	—		23.0	4	22.8	8	23.6
Orbital Breadth	22	39.8	7	38.3	—	—	—	—	4	38.5	8	40.4
Orbital Height	27	32.6	7	30.1	—	—	4	33.4	4	30.2	8	32.1
Cranial Index	53	71.7	10	75.6	19	71.4	21	72.3	10	81.4	14	72.8
Length-Height Index	25	70.0	6	72.9	19	68.9	13	72.3	7	72.5	9	72.5
Breadth-Height Index	25	96.1	6	95.4	19	96.4	*	99.3	7	89.3	9	99.5
Facial Index	8	86.9[b]	—	—	—	—	—	—	—	—	3	94.0
Upper Facial Index	*	54.3	6	52.8	—	—	*	59.0(?)	—	—	7	54.0
Orbital Index	22	81.9	7	78.8	19	80.0	—	—	4	76.5	8	79.7
Nasal Index	21	45.4	6	60.8	19	45.7		49.8	3	48.4	8	46.8

[b] Not in Morant's table; reworked from *Crania Britannica* and Thurman.

	19		20		21		22		23		24	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	—	—	—	—	—	—	—	—	—	—	—	—
Horizontal Circumference	8	526.2	—	—	4	516.5	—	—	—	—	—	—
Maximum Length	9	183.1	44	175.5	8	179.9	20	181.9	27	184.2	15	192.3
Maximum Breadth	9	147.0	44	143.4	8	146.5	20	152.2	27	151.0	15	139.4
Basion-Bregma Height	7	139.6	34	136.0	—	—	18	142.0	22	140.0	13	146.5
Minimum Frontal Diameter	9	97.0	41	97.5	9	101.0	—	—	—	—	—	—
Bizygomatic Diameter	4	136.8	21	129.4	3	129.3	11	137.4	17	138.0	9	133.9
Bigonial Diameter	—	—	—	—	—	—	—	—	—	—	—	—
Total Face Height	4	119.2	5	117.2	6	116.2	17	118.8	24	122.9	10	126.2
Upper Face Height	6	69.8	31	67.7	7	69.9	9	67.9	16	69.6	9	71.3
Nose Height	6	50.2	33	49.9	7	51.9	9	51.1	15	50.1	8	59.2
Nose Breadth	6	23.5	33	24.2	7	24.9	—	—	—	—	—	—
Orbital Breadth	6	41.3	—	—	7	41.3	—	—	—	—	—	—
Orbital Height	6	33.2	—	—	7	33.1	—	—	—	—	—	—
Cranial Index	9	80.3	44	81.7	8	81.6	20	83.0	27	81.6	15	72.5
Length-Height Index	7	76.1	34	77.5	—	—	18	77.9	23	76.0	13	76.2
Breadth-Height Index	7	95.2	34	94.8	—	—	*	93.4	*	92.7	*	105.1
Facial Index	4	89.3	5	90.6	*	89.9	*	86.5	*	89.1	*	94.3
Upper Facial Index	4	50.5	31	52.3	3	54.2	*	49.4	*	50.4	*	53.3
Orbital Index	6	80.6	—	—	7	80.3	—	—	—	—	—	—
Nasal Index	6	46.9	33	48.5	7	4.79	—	—	—	—	—	—

	25		26		27		28		29		30	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	18	1492.5	—	—	22	1465.	—	—	—	—	—	—
Horizontal Circumference	31	525.0	5	525.0	—	—	—	—	31	512.8	10	544.5
Maximum Length	44	180.8	6	182.4	36	188.2	59	194.7	32	185.9	10	195.4
Maximum Breadth	41	148.0	6	143.5	36	137.7	57	134.6	32	135.3	10	142.5
Basion-Bregma Height	35	136.4	5	142.5	17	141.8	31	141.9	20	135.6	9	146.7
Minimum Frontal Diameter	3	102.7	5	102.8	28	97.2	—	—	31	96.5	10	99.4
Bizygomatic Diameter	20	133.9	5	130.9	9 +	128.7	20	127.7	24	125.3	4	140.2
Bigonial Diameter	—	—	4	98.0	—	—	—	—	11	95.8	—	—
Total Face Height	—	—	4	117.2	7	120.6	14	115.5	10	113.9	6	126.0
Upper Face Height	18	66.9	5	71.1	9	69.8	21	67.7	23	67.9	7	73.6
Nose Height	18	49.9	6	52.3	—	—	—	—	23	50.1	7	55.6
Nose Breadth	24	24.8	6	25.1	—	—	—	—	23	24.2	7	26.8
Orbital Breadth	10	43.4	6	40.7	—	—	—	—	25	41.9	7	43.3
Orbital Height	23	33.4	6	33.7	—	—	—	—	25	31.5	7	32.5
Cranial Index	37	81.9	7	79.8	36	73.6	98	70.9	32	72.7	10	73.0
Length-Height Index	35	75.3	5	76.9	17	75.6	59	74.7	31	74.4	9	74.8
Breadth-Height Index	*	92.2	5	95.6	17	102.8	59	104.1	28	101.9	9	101.9
Facial Index	—	—	*	89.5	7	93.2	—	—	11	91.6	3	92.2
Upper Facial Index	*	50.0	4	54.0	9	54.1	44	52.8	23	54.3	4	54.5
Orbital Index	10	75.1	8	80.0	14	79.4	55	79.2	25	75.3	7	75.1
Nasal Index	17	50.4	8	46.6	9	48.6	47	47.7	22	48.8	7	48.3

	31		32		33		34		35		36	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	—	—	—	—	—	—	43	1500	61	1487.8	12	1561.2
Horizontal Circumference	64 ca.	523	—	—	23	516.3	81	530.3	73	528.3	26	530.0
Maximum Length		185	24	187.8	27	183.6	83	186.6	61	187.4	30	189.1
Maximum Breadth		139	24	135.7	27	143.3	83	143.2	102	141.4	31	144.1
Basion-Bregma Height		135	11	137.4	10	135.3	73	132.9	77	132.9	14	131.6
Minimum Frontal Diameter		99	3	95.7	24	96.7	81	96.5	45	98.0	26	96.4
Bizygomatic Diameter		136	5	127.2	12	129.0	57	132.3	55	130.6	7	131.6
Bigonial Diameter	—	—	—	—	6	96.4	33	103.7	—	—	—	—
Total Face Height	—	—	7	117.7	3	114.3	37	117.7	—	—	3	119.7
Upper Face Height		72	7	68.1	12	70.2	69	70.1	30	69.1	10	70.1
Nose Height		52	12	49.9	11	51.0	71	51.5	99	50.6	12	49.6
Nose Breadth		25	11	23.4	11	24.9	68	24.0	67	23.7	10	24.4
Orbital Breadth		40	8	39.5	13	43.0	71	39.6	21	39.3	12	38.7
Orbital Height		33	8	31.2	13	31.9	70	32.6	65	33.6	12	38.5
Cranial Index		74	22	72.4	27	75.2	83	76.9	86	75.4	30	76.2
Length-Height Index		74	10	73.8	27	73.3	73	71.3	61	70.9	14	69.8
Breadth-Height Index		97	10	98.8	26	97.0	72	93.0	77	94.0	14	91.3
Facial Index		—	3	87.3	5	89.7	30	88.4	—	—	*	91.0
Upper Facial Index		53	4	51.6	11	53.7	55	52.7	*	52.9	6	53.6
Orbital Index		83	12	81.8	14	74.9	67	82.4	21	85.5	12	86.9
Nasal Index		48	12	46.4	11	49.0	68	46.3	67	46.8	10	48.9

	37		38		39		40		41		42	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	57	1466.8	—	—	—	—	—	—	—	—	24	1510.0
Horizontal Circumference	—	—	24	528.8	36	527.6	13	528.0	24	534.5	40	537.8
Maximum Length		183.6	24	189.7	42	190.5	14	189.1	26	194.3	41	191.8
Maximum Breadth		140.9	24	137.8	42	137.6	14	137.4	25	138.6	41	140.7
Basion-Bregma Height		132.6	24	131.7	27	132.9	13	136.7	21	136.7	30	134.5
Minimum Frontal Diameter		96.9	24	99.2	36	95.8	14	97.2	25	96.6	39	98.3
Bizygomatic Diameter		133.3	16	130.4	28	127.4	10	131.5	8	139.0	28	132.3
Bigonial Diameter	—	—	—	—	—	—	—	—	—	—	—	—
Total Face Height	—	—	—	—	19	116.3	3	115.3		119.9	22	116.9
Upper Face Height		68.0	20	70.3	28	69.5	11	66.6	13	72.8	27	70.7
Nose Height		52.5	23	52.5	28	51.3	7	50.7	13	51.5	28	52.0
Nose Breadth		24.7	22	23.7	27	24.1	7	24.4	13	24.8	27	25.0
Orbital Breadth		39.2	23	40.2	—	—	7	39.0	16	41.8	29	41.4
Orbital Height		31.9	23	33.3	—	—	7	32.1	17	33.9	31	32.4
Cranial Index		76.4	24	72.8	42	72.3	14	72.7	25	71.3	41	73.3
Length-Height Index		73.6	24	69.9	27	70.9	13	72.0	21	69.5	30	70.1
Breadth-Height Index		94.7	*	95.8	*	96.6	13	99.3	*	96.3	30	98.3
Facial Index	—	—	—	—	18	91.9	3	87.4	—	83.6	—	—
Upper Facial Index		50.9	13	55.5	28	54.6	10	51.3	8	52.4	25	53.5
Orbital Index		81.9	23	82.5	28	81.9	7	82.5	16	82.5	29	78.3
Nasal Index		47.2	22	45.5	26	46.9	7	48.2	13	48.2	27	48.0

	43		44		45		46		47		48	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	31	1543.3	—	—	36	1500.	—	—	22	1432.	—	—
Horizontal Circumference	73	532.0	60	527.0	131	532.0	6	532.2	—	—	57	522.3
Maximum Length	58	190.6	62	188.5	136	187.0	11	191.5	26	183.1	60	185.2
Maximum Breadth	103	141.7	61	140.9	130	142.6	11	140.8	26	140.6	60	141.9
Basion-Bregma Height	31	137.7	32	135.0	105	132.2	7	134.1	24	133.1	41	143.4
Minimum Frontal Diameter	59	97.3	59	96.8	134	97.0	9	97.1	26	97.6	59	98.2
Bizygomatic Diameter	34	133.3	26	132.2	66	132.3	4	135.0	29	132.2	44	129.4
Bigonial Diameter	33	100.4	25	102.9	52	103.3	—	—	19	99.0	24	103.4
Total Face Height	34	115.8 [c]	25	118.3	42	115.6	—	—	18	114.2	24	119.5
Upper Face Height	22	71.7	41	72.3	86	69.5	—	—	23	65.9	44	69.9
Nose Height	22	52.2	41	52.0	99	50.9	3	51.7	25	51.6	44	51.2
Nose Breadth	28	24.5	39	24.1	89	24.0	3	23.3	22	24.7	44	26.4
Orbital Breadth	19	42.5	40	38.8	98	39.5	4	42.5	23	38.4	46	38.8
Orbital Height	29	33.3	40	33.0	97	31.9	4	33.0	25	33.5	45	32.3
Cranial Index	52	74.7	61	74.9	129	76.4	11	73.5	26	76.6	60	77.0
Length-Height Index	25	71.2	32	71.9	105	70.7	8	70.5	24	72.7	41	74.1
Breadth-Height Index	61	97.2	32	95.8	102	92.8	8	95.3	24	95.0	41	99.8
Facial Index	*	86.4 [c]	16	90.3	33	86.8	—	—	17	87.7	*	92.4
Upper Facial Index		53.8	26	54.6	60	51.7	—	—	17	50.4	42	52.2
Orbital Index	*	78.4	36	85.1	82	80.6	4	78.0	22	85.5	45	83.3
Nasal Index	19	47.5	39	47.5	90	47.4	3	45.3	23	48.8	42	49.2

[c] Since no total face height or facial index means were given with the London Museum series, the figures for the Burwell series of Layard and Young have been substituted.

	49		50		51		52		53	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Cubic Capacity (in c. c.)	—	—	—	—		1390.	—	—		1454.
Horizontal Circumference	—	—	—	—		528.	7	527.9		524.
Maximum Length	7	186.1	8	183.0		184.	7	188.7		186.
Maximum Breadth	7	144.0	8	142.1		147.	7	138.6		138.
Basion-Bregma Height	7	136.6	6	138.5		126.	5	135.4		137.
Minimum Frontal Diameter	5	94.0	8	97.6		93.	7	95.9		97.
Bizygomatic Diameter	6	134.5	5	137.6		138.	4	130.5		134.
Bigonial Diameter	—	—	—	—	—	—	6	97.0	—	—
Total Face Height	—	—	—	—		126.	—	—		119.
Upper Face Height	6	70.0	5	67.6		74.	4	65.3		70.
Nose Height		—		—		55.	4	50.0		52.
Nose Breadth	—	—	—	—		26.	4	25.3		25.
Orbital Breadth	—	—	—	—		37.	5	39.2		40.
Orbital Height	—	—	—	—		32.	5	31.0		33.
Cranial Index	7	77.4	8	77.7		79.9	7	73.4		74.3
Length-Height Index	7	73.5	6	75.8		68.5	5	71.9		73.9
Breadth-Height Index	7	95.0	6	97.0		85.7	5	97.8	*	99.3
Facial Index	—	—	—	—		91.3	—	—		89.4
Upper Facial Index	6	52.1	5	49.1		53.6	3	50.9		52.8
Orbital Index	6	81.1	5	74.1		86.5	5	79.6		84.0
Nasal Index	6	49.0	5	52.8		42.3	4	50.7		48.7

Appendix II

GLOSSARY

ADRIATIC. A name given by Deniker to the Dinaric race. See p. 282.

AENEOLITHIC. The Copper Age, a period of transition between the Neolithic and the Bronze Age.

AFALOU TYPE. The rugged, oversized racial type found at Afalou bou Rummel in Algeria.

AFGHANIAN. Name proposed in the present work for the skeletal counterpart of the Irano-Afghan race. See p. 85.

AHRENSBURG. A tanged-point culture of the Early Mesolithic in northwestern Europe. See p. 70.

ALBINO. A person totally deficient in pigmentation.

ALOPECIA. Baldness.

ALPINE. A name proposed by Ripley and used in this work in its original sense. The main group of reduced Upper Palaeolithic survivors in Europe and in western and central Asia. See p. 291.

ALTAIC. A linguistic stock widely prevalent in Asia and to a lesser extent in Europe, including Turkish, Mongolian, Tungusic, and possibly Korean. See pp. 236–240.

ALVEOLAR. Pertaining to the tooth-bearing segments of the maxillary bones.

ALVEOLAR PROGNATHISM. A protrusion of the jaws, specifically in the region lying between the nose and the teeth.

ALVEON (also prosthion). The most anterior point on the alveolar border of the upper jaw, on the median line between the two upper median incisors.

ANAN'INO. An Iron Age culture of east-central Russia, supposedly associated with Finnic-speaking peoples. See p. 224.

ANCYLUS. Name given the Baltic lake in Boreal times. See pp. 70–71.

ANDRONOVO. A Late Bronze Age culture of southwestern Siberia.

ANGLO-SAXON TYPE. A sub-type of Nordic which contains unreduced Upper Palaeolithic mixture. See p. 293.

ANNULAR CONSTRICTION. An artificial method of altering the head shape by the application of bands.

ANTHROPOMETRY. The measurement of the bodily characters of human beings.

ARCTIC CULTURE. An early Post-Glacial Stone Age culture of northwestern Europe, with marked Upper Palaeolithic survivals.

ARCUS SENILIS. A deposit of fat in the cornea of the eye, which looks gray or blue and often creates a false impression of partial eye blondism. See p. 244.

ARMENOID. A Dinaricized Irano-Afghan type. See p. 293.

ARTIFACT. Any object fashioned by man for use.

ASCENDING RAMUS. The paired portion of the jawbone which rises from the

gonial region at the back of the tooth-bearing portion of the jaw to the condyle and coronoid process.

ASH-BLOND (also cendré). A class of hair-blondism in which rufosity is totally absent; ash-blond hair has a grayish or "platinum" appearance.

ASSYRIOID. Deniker's name for the Armenoid racial type. See p. 282.

ASTURIAN. A Mesolithic culture of northwestern Spain.

ATERIAN. A protracted and specialized derivative of the Mousterian culture which persisted along the Atlantic coast of Morocco into presumably Postglacial times. See p. 39.

"ATHLETIC." The second of the three constitutional types postulated by the students of human constitution; somatic—heavily muscled, heavy-boned, square.

ATLANTIC. Name given Period III of Baltic Mesolithic chronology, 5600–2500 B.C. See pp. 70–72.

ATLANTO-MEDITERRANEAN. A tall brunet Mediterranean sub-race, the living equivalent of the skeletal Megalithic. Name originally given it by Deniker. See p. 282—see also p. 292 for definition in present classification.

ATLAS. The topmost cervical vertebra, which bears the lower pair of condyles upon which the skull balances.

AUNJETITZ (Unetičé). The Early Bronze Age culture of the Danubian region.

AURICULAR. Pertaining to the ear or ear hole.

AURICULAR HEAD HEIGHT. The height of the cranial vault measured from the top of the ear hole, or from tragion, to vertex. This measurement is taken on both crania and the living; on the living it is the only head height dimension commonly taken.

AURIGNACIAN. The first of the three Upper Palaeolithic cultures of western Europe, beginning in the warm Laufen Interglacial and ending during the Würm II advance. More recently found in parts of Asia and Africa.

AUSTRALOID. One of the major racial divisions of mankind, typified by the aborigines of Australia.

AXIS, AXILLARY. The arm pit. Axis also means the second cervical vertebra from the top.

AZILIAN. A Mesolithic culture of western Europe.

BADARIAN. A predynastic culture of Upper Egypt. See p. 94.

BANDED. A type of Neolithic pottery, found first in Danubian I, decorated by bands of incisions.

BASION. An anatomical point on the midpoint of the posterior border of the foramen magnum.

BASION-BREGMA HEIGHT. The height of the cranial vault from basion to bregma.

BATTLE-AXE PEOPLE. Another name for the Corded people, who habitually buried double-bitted stone battle-axes with their dead.

BEAKER. See Bell Beaker, Zoned Beaker. The term Beaker, used alone, serves conveniently to designate either or both subdivisions.

BELL BEAKER. A type of Early Bronze Age pottery characteristic of a culture which is believed to have arisen in Spain, and which had wide ramifications in western and central Europe.

BELL-SHAPED CURVE (normal probability curve). A statistical phenomenon; the distribution curve which results under conditions of random sampling when frequencies of consecutive metrical categories are plotted in a significant biometric sample.

BIACROMINAL DIAMETER. Shoulder breadth, the distance between the acromion processes of the scapulae (shoulder blades) in the living.

BICONDYLAR DIAMETER. The maximum external distance between the condyles of the mandible.

BIGONIAL DIAMETER. The maximum distance between the external gonial angles of the mandible, taken both on the dry mandible and on the living.

BI-ILIAC DIAMETER. The distance between the iliac crests of the pelvis; maximum hip breadth.

BIMAXILLARY BREADTH. The distance between the lower borders of the malar-maxillary sutures of the facial skeleton.

BIMODAL. The condition which occurs when two metrically distinct factors are present in a numerically adequate frequency curve so that the curve has two distinct peaks.

BIOMETRIC. Pertaining to the accurate measurement of living beings.

BIORBITAL DIAMETER. The distance between the outer borders of the two bony orbits.

BIZYGOMATIC DIAMETER. The maximum distance between the two zygomatic arches; face breadth.

BOAT-AXE. Another name for the perforated, double-bitted stone battle-axe used by the Corded people.

BODILY HABITUS. Constitutional type, bodily build.

BOREAL. Period II of the Baltic Mesolithic, from 6800 to 5600 B.C. See pp. 70–71.

BORREBY. An unreduced brachycephalic Upper Palaeolithic survivor. See page 291.

BRACHYCEPHALIC. Possessing a cephalic index of 81.0 to 85.4; round or short headed.

BRACHYCEPHALIZATION. The process of producing brachycephaly within a population.

BRACHYCEREBRAL. A term coined to indicate a round or relatively short-brained condition.

BRACHYCRANIAL. Possessing a cranial index of 80.0 and over, round- or short-skulled.

BREADTH-HEIGHT INDEX. $\frac{\text{Head height} \times 100}{\text{Head breadth}}$. On the living the height measurement is the auricular height; on the skull the basion-bregma height is usually employed.

BREGMA-LAMBDA ARC. The sagittal length of the parietal bones, measured on the outer surface of the cranial vault.

BROCH. A type of corbelled stone tower of Bronze Age date found in Scotland. See p. 148.

BROWRIDGE. A prominence of the frontal area immediately above the orbits and nasal root, and, on the living, underlying the eyebrows.

BRÜNN. Name of a city in Czechoslovakia, and of a number of Upper Palaeolithic skulls found nearby. In the present work it also designates a living racial type which recapitulates that of the dolichocephalic Aurignacian peoples of central Europe. See p. 291.

BRYTHONIC. Kymric, P-Keltic of England and Wales.

BURGWALL. Name given to Slavic moated villages of the early Christian era. See p. 216.

BURYAT-MONGOL. A brachycephalic mongoloid race with extreme mongoloid features.

BUSHMAN. A native of South Africa. The Bushmen and Hottentots form together one of the primary racial divisions of mankind.

CALVA. The skull cap, lacking the face and the base of the skull.

CALVARIUM. The entire skull with the exception of the mandible.

CANINE FOSSA. A depression in the maxillary bone immediately under the infra-orbital foramen of the cranium.

CAPPADOCIAN. See p. 85.

CAPSIAN. See p. 35.

CAUCASIC. Languages spoken in the Caucasus, including Georgian, Circassian, Chechen and Lesghian—these languages, which may or may not be mutually related, form the nucleus of Marr's "Japhetic" stock. (See Japhetic.)

CELT. A polished stone axe or adze.

CENOZOIC. The division of geological time extending from the end of the Mesozoic to the present.

CENTUM. One of the two primary divisions of the Indo-European linguistic stock, based on the retention of the consonant K.

CEPHALIC INDEX. $\frac{\text{Head length} \times 100}{\text{Head breadth}}$. The ratio of head length to head breadth; the most commonly used index of the human body in racial studies.

CEPHALIC MODULE. $\frac{\text{Head length} + \text{head breadth} + \text{auricular height}}{3}$. The average of the three principal diameters of the cranial vault on the living; thus a measure of absolute head size.

CERVICAL. Pertaining to the neck.

CHALCOLITHIC. The Copper Age. See Copper Age, Aenolithic.

CHAMAECONCH. Possessing an orbital index of 82.9 and under; low-orbitted.

CHAMAERRHINE. Possessing a nasal index of 51.0 and over on the skull; relatively wide-nosed.

CHATELPERRONIAN. A division of the Aurignacian of western Europe distinguished on the basis of a special flint-chipping technique and formerly known as the Lower Aurignacian.

CLAVICO-HUMERAL INDEX. $\frac{\text{Maximum clavicle length}}{\text{Maximum humerus length}}$. The ratio between the length of the clavicle (collar bone) and that of the humerus (upper arm bone); see p. 41.

COEFFICIENT OF VARIATION. See p. 246.

COMBED POTTERY. See p. 125. A Neolithic pottery type found at various points in the forest belt stretching across three continents from the Baltic to New England.

CONDYLES. The paired articulating surfaces of a bone at a movable joint; occipital condyles are the surfaces of the base of the skull which articulate with the axis; mandibular condyles are the hinges of the jaw.

CONSTITUTIONAL TYPE. See pyknic, somatic, leptosome. A division of mankind into specific types on the basis of total bodily form, cutting across conventional racial lines.

COPPER AGE. A period of transition between the Neolithic and the Bronze Age, also called Aenolithic.

CORDED. A type of pottery decoration made by applying cords to the surface of the pot when wet; the people who habitually used these pots; the skeletal racial type of these people. See p. 85.

CORNEA. The outer layer of eye tissue immediately over the iris.

CORRELATION. The established relationship between two or more variables; see p. 250.

CORRIDOR TOMB. A late Megalithic burial chamber in the form of a long corridor.

CRANIAL INDEX. $\frac{\text{Cranial length} \times 100}{\text{Cranial breadth}}$.

CRANIOLOGY, CRANIOLOGICAL. The science of the skull.

CRANIUM. The entire skull, including the mandible.

CRESWELLIAN. A Postglacial culture of Great Britain, Mesolithic with strong Aurignacian tradition.

CURVOCCIPITAL. Having a curved occipital region.

CUSHITIC. A term used to designate the Hamitic languages of East Africa.

CYPRIOTE. Pertaining to the Bronze Age in Cyprus.

DALO-NORDIC. See p. 285. Paudler's name for dolichocephalic unreduced Upper Palaeolithic survivors. Also called Fälish by Günther.

DANUBIAN. The small mesorrhine or chamaerrhine Mediterranean racial type which introduced Neolithic food production into central Europe. See p. 85.

DARDIC. A division of Satem Indo-European speech closely related to Iranian.

DIASPORA. Scattering, migration in many directions, applied specifically to historical Jewish movements.

DINARIC. A racial type concentrated in the mountain zone reaching from Switzerland to Epirus. See p. 293.

DINARICIZATION. A special process of hybridization; see Chapter XII, secs. 11, 12, 17; also legend to plate 35.

DOLICHOCEPHALIC. Possessing a cephalic index of 75.9 and under; long- or narrow-headed, or both.

DOLICHOCRANIAL. Possessing a cranial index of 74.9 and under; long- or narrow-skulled, or both.

DOLMEN. A megalithic chambered rock tomb, originally covered with earth.

DOMINANCE. In Mendelian terminology, the ability of a given genetic trait or character to assert itself over a so-called "recessive" trait or character.

DRAVIDIAN. A language family of southern India and Baluchistan. Also a racial type designated by Deniker. See p. 282.

EAST BALTIC. A composite race found in eastern Baltic lands, of composite origin. See p. 292.

ELMENTEITAN. A microlithic culture found by Leakey in East Africa, and called Mesolithic. Its exact time position is in doubt. See p. 57.

ENDOCRANIAL. Referring to the inner surface of the cranial vault.

ENDOCRINE. Pertaining to the ductless glands.

EPICANTHUS. See mongoloid fold.

EPIPALAEOLITHIC. A name given the early Mesolithic cultures of largely Palaeolithic inspiration.

ERTEBØLLE. A mesolithic culture of the Baltic region during Atlantic times (Period III). See pp. 70–72.

ETHNIC UNIT. A concept which has both sociological and biological implications: a community in the larger sense of the word; an intermarrying group of people united in a cultural sense, and forming an ethnos, but not necessarily united geographically.

EURAFRICAN. A name given by Sergi to the entire white group of dolichocephalic tendency, as opposed to Eurasiatic. Among Mesopotamian archaeologists this word has taken on a special meaning. See p. 87.

EURASIATIC. Sergi's word to designate the entire body of brachycephalic whites. See p. 284.

EURYENE. Possessing an upper facial index of 49.9 and under on the skull; short or broad upper-faced, or both.

EURYPROSOPIC. Possessing (on the living) a facial index of 83.9 and under; short- or broad-faced, or both.

EYE-EAR PLANE. A conventional or standard level at which the skull is placed for craniometric study, with the lower border of the left orbit on the same horizontal plane as the upper borders of the two ear holes.

FACETS (SQUATTING). Supplementary articulary surfaces of the foot and leg bones thought to be caused by habitual squatting.

FACIAL INDEX. $\frac{\text{Total face height} \times 100}{\text{Bizygomatic}}$. Used both on the cranium and on the living.

FÄLISH. See Dalo-Nordic.

FATJANOVO. A Neolithic culture of southern Russia and the Caucasus.

FAVUS. A serious scalp disease which causes baldness and reduces the regions affected to scar tissue.

FEMUR. The thigh bone.

FENNO-Nordic. The name given by von Eickstedt to a hypothetical eastern branch of the Nordic race. See p. 282.

FIBULA. The outer and thinner of the two long bones of the lower leg.

FINNO-Ugrian. The major branch of the Uralic linguistic stock, and a possible element in the formation of Indo-European. See pp. 337–339.

FOETALIZED, FOETALIZATION. See p. 291, footnote 56.

FOOD-VESSEL. A Bronze Age ceramic type, used in Ireland and western Great Britain.

FORAMEN MAGNUM. The main opening at the base of skull through which the brain is connected to the major nerves of the body.

FRONTAL. Pertaining to the bone of the skull which underlies the forehead.

FRONTAL BOSSES. Paired tuberosities or eminences on the forehead.

GERONTOMORPHIC. The opposite of foetalized, paedomorphic, and infantile. A word coined by Marett to indicate an extremely adult phenotypical condition.

GIBBONOID. Resembling the gibbon, the smallest and most arboreal of the four man-like apes.

GLABELLA. The area of the frontal bone, usually projecting, which lies immediately above the root of the nose and which forms the central portion of the brow region.

GLABELLO-OCCIPITAL LENGTH. The maximum length of the skull taken from glabella.

GLABROUS. Hairless.

GONIAL ANGLES. The outer posterior angles or corners of the lower jaw, at the bases of the ascending rami.

GRIMALDIAN. A local form of Aurignacian, found in Italy, which persisted without interruption to the Neolithic. See p. 69, footnote 30.

GUANCHE. The name given the pre-Spanish inhabitants of the Canary Islands. Hooton's name for the Afalou-like Canarian type of skull.

HALLSTATT. The first of the two major divisions of the central European Iron Age.

HAMBURG CULTURE. A local Upper Palaeolithic culture of northern Germany, in part contemporaneous with the French Magdalenian. See p. 70.

HAMITIC. A linguistic stock confined to the continent of Africa. Also used in a racial sense to designate the slightly negroid tall Mediterranean racial division associated locally in East Africa with Hamitic languages.

HEAD-SPANNER. A special anthropometric instrument designed to facilitate measurement of auricular head height on the living. See p. 243.

HELLADIC. A Bronze Age cultural period in Greece.

HELLENIC. A branch of Indo-European speech.

HORIZONTAL CIRCUMFERENCE. The maximum circumference of the cranial vault taken above the browridges.

HUMERUS. The upper arm bone.

HYPERBRACHYCEPHALIC, -Y. Possessing a cephalic index of 85.6 and over; extremely round- or short-headed.

HYPERDOLICHOCEPHALIC. Possessing an extremely low cephalic index; extremely long- or narrow-headed, or both.

HYPEREURYENE. Possessing an upper facial index of 44.9 and under on the skull, extremely long or narrow upper-faced, or both.

HYPERLEPTOPROSOPIC. Possessing (on the living) a facial index of 93.0 or over; extremely long- or narrow-faced, or both.

HYPERMASCULINE. Possessing in excessive quantity traits which may be considered to be male secondary sex characters.

HYPSICEPHALIC. Possessing a length-height index of 62.6 and over on the living; high headed.

HYPSICONCH. Possessing an orbital index of 89.0 and over; high orbitted.

IBERO-INSULAR. Deniker's name for the short-statured, relatively small Mediterranean sub-race, called in this book Mediterranean Proper, or small Mediterranean. See pp. 282–283.

INCIPIENT BLONDISM. A minor incidence of mixed eye color; of reddish or brown hairs, most frequent on the beard; or both. It is suggested that such occurrences of partial blondism in a population remote from Nordic centers may be an endemic mutative tendency and not the result of mixture with Nordics or members of other fully blond races.

INCIPIENTLY MONGOLOID. A racial type which has evolved part way in a mongoloid direction, and which may have other, non-mongoloid specializations of its own, is called incipiently mongoloid.

INDO-AFGHAN. Deniker's name for the racial type designated in this book as Irano-Afghan. See p. 282.

INDO-ARYANS. Name given the Indo-European-speaking invaders of Persia, Afghanistan, and India.

INDO-EUROPEAN. A linguistic stock to which most languages spoken in Europe belong; it is thought to have been originally a hybrid between Finno-Ugrian and Caucasic with an early Altaic infusion. See pp. 178–182.

INFANTILISM. Presence in the adult phenotype of certain features which appear to be infant-like; a condition which is partially synonymous with foetalization and paedomorphism.

INION. A projection in the center of the superior nuchal line of the occipital bone. Inion may be absent in cases of occipital torus.

INTEGUMENT. Skin, as opposed to membrane.

INTEGUMENTAL LIPS. The entire fleshy section of the outer face, covered with integument, reaching from chin to nose, which may be designated as upper and lower lips.

INTERGLACIAL. A geological period of relative warmth falling between two major glacial advances.

INTEROCULAR DIAMETER. The distance between the inner corners of the eyes.

INTERORBITAL DISTANCE. The distance between the inner borders of the bony eye-sockets.

INTERPLUVIAL. A geological period of low precipitation between pluvial maxima.

IRANO-AFGHAN. The living replica of the skeletal Afghanian race. See p. 292.

IRIDICAL. Pertaining to the iris.

IRIS. The light-diaphragm of the eye.

JAPHETIC. A hypothetical linguistic stock postulated by Professor Marr. See p. 175.

KAMMKERAMIK. See Combed pottery.

KELTIC IRON AGE TYPE. A sub-type of Nordic associated with Keltic-speaking peoples during the Iron Age. See pp. 292–293.

KHOI-SAN. The Bushman-Hottentot linguistic stock; also, the Bushman-Hottentot people.

KITCHEN-MIDDEN. An archaeological shell deposit, usually occurring along the sea-shore and often of Mesolithic date.

KURGAN. A type of burial mound used in eastern Europe, especially southern Russia, from the Neolithic period through the Iron Age.

LADIN. The Rhaeto-Roman language of the Engadine, in the canton of Grisons, Switzerland; also in the Italian Tyrol.

LADINO. The archaic Spanish language of the Sephardic Jews, not to be confused with the Rhaeto-Roman Ladin of the Grisons and Tyrol.

LADOGAN. An eastern European racial type of Upper Palaeolithic origin. See pp. 291–292.

LAKE DWELLING CULTURE. A lacustrine Neolithic culture of western Switzerland, notable because of the preservation of wooden objects, textiles, and vegetable foodstuffs in the mud under the Lake Dwellings. It is actually a Mesolithic survival with the addition of a Neolithic economy. See p. 113.

LAMBDOID. Pertaining to the region of lambda, at the juncture of the parietal and occipital bones.

LAMBDOID FLATTENING. An inheritable and non-artificial flattening or depression of the segment of the sagittal suture of the skull immediately above lambda.

LAPPISH. A racial type identified with the Lapps in their unmixed form. See p. 292.

LAPPONOID. Czekanowski's name for the Alpine race. See p. 288.

LA TÈNE. The second or Keltic Iron Age in central Europe and elsewhere.

LATERAL. A word used in this work to describe stocky, thick-set, wide-bodied constitutional types or type combinations, implying somatic, pyknic, or both.

LAUFEN. The name given the Würm I–Würm II interglacial period of the Late Pleistocene.

LAUSITZ. A central European Urnfields culture of the Late Bronze Age.

LENGTH-HEIGHT INDEX. $\frac{\text{Head height} \times 100}{\text{Head length}}$. On the living, the height measurement is the auricular height; on the skull, the basion-bregma height is usually employed.

LEPTENE. Possessing an upper facial index of 55.0 and over on the skull; long or narrow upper-faced, or both.

LEPTOPROSOPIC. Possessing (on the living) a facial index of 88.0 to 92.9; long- or narrow-faced, or both.

LEPTORRHINE. Possessing a nasal index of 46.9 and under on the skull, or of 69.9 and under on the living; relatively narrow-nosed.

LEPTOSOME. The third component designated by students of constitutional types; long, lean, narrow, attenuated.

LEVALLOISO-MOUSTERIAN. A Middle Palaeolithic culture with both Levalloisian and Mousterian elements.

LINEAR. A word used in this work to describe slender, wiry, thin-bodied constitutional types or type combinations, implying leptosome, somatic, or both.

P SEAM. A thin zone of connective tissue separating the membrane of the lips from the integument.

TORINA. The name given the salt Baltic Sea during Atlantic time, from 5000–2400 B.C.

TTORAL. An alternate name, employed by Deniker, to designate the Atlanto-Mediterranean race. See p. 282.

NG BARROW. An earth covered Megalithic tumulus found principally in the British Isles. Also, the exaggeratedly long-headed Mediterranean racial type associated with these burials. See p. 111.

NGBY. An antler ax culture of the Early Mesolithic in northwestern Europe. See pp. 70–71.

AGDALENIAN. The final cultural division of the Upper Palaeolithic in most of Europe, lasting through the Würm II maximum.

AGLEMOSE. A Mesolithic forest culture of northern Europe during Boreal times (6800–5600 B.C.). See pp. 70–72.

ALARS. The paired cheek-bones.

ANDIBLE. The lower jaw-bone.

ASTICATORY APPARATUS. The mandible, maxillae, glenoid fossae, teeth, and the muscles of chewing.

ASTOID CRESTS. See supramastoid ridges.

AXILLAE. The paired bones of the face which bear the teeth of the upper jaw.

AXIMUM BIPARIETAL BREADTH. The maximum breadth of the skull taken above the supramastoid crests.

AXIMUM FRONTAL DIAMETER. The distance between the lower anterior extremities of the frontal bone at the fronto-malar junctures.

EAN. The statistical average of a metrical series.

EDITERRANEAN. A name used in this work to designate the entire family of non-Neanderthaloid dolicho- or mesocephalic whites, including both blond and brunet varieties. In the narrower sense it refers to the small Mediterranean, Mediterranean Proper, or Ibero-Insular race. See pp. 82–86.

EGALITHIC. A name given in this work to the skeletal protype of the Atlanto-Mediterranean race. See p. 85.

ELANIN. See definition on p. 273.

EMBRANOUS LIPS. The portion of the lips, exposed when the mouth is normally closed, which is covered by membrane.

ENDELIAN. Pertaining to the laws of inheritance postulated by Mendel.

ENTAL. Pertaining to the bony chin. Also, the usual meaning of the word.

ENTON. The lowest central point of the symphysis of the mandible, beneath the bony chin.

ERIMDIAN. An Early Neolithic culture of the Egyptian Delta. See p. 93.

EROVINGIAN. Pertaining to the Germanic inhabitants of France and Belgium from the days of the Frankish invaders to the fall of the Merovingian dynasty.

ESENE. Possessing an upper facial index of 50.0 to 54.9 on the skull; of moderate or intermediate upper face form.

MESOCEPHALIC. Possessing a cephalic index of 76.0 to 80.9; intermediate in head form.

MESOCONCH. Possessing an orbital index of 83.0 to 88.9; of moderate or intermediate orbital form.

MESOCRANIAL. Possessing a cranial index of 75.0 to 79.9; of moderate or intermediate skull form.

MESOLITHIC. See page 56 for definition.

MESOPROSOPIC. Possessing (on the living) a facial index of 84.0 to 87.9; moderate in face form.

MESORRHINE. Possessing a nasal index of 47.0 to 50.9 on the skull, or of 70.0 to 84.9 on the living; of moderate nasal proportions.

METRICAL CHARACTERS. Diameters, circumferences, arcs, and indices; anatomical traits numerically expressed.

MICHELSBERG. A Neolithic pottery culture of southwestern Germany, supposedly of North African inspiration. See p. 110.

MICROCEPHALIC. Pathologically very small-headed, with an implication of mental deficiency.

MICROLITHS. Small flint blades characteristic of the Mesolithic in Europe and culturally derived from North Africa, western Asia, or both.

MIDDEN. A shell heap.

MINERAL DEFICIENCY. A deficiency, over a long period of time, of certain minerals in the human diet has been proposed by Marett as one of the basic causes of human racial differentiation.

MINIMUM FRONTAL DIAMETER. The minimum distance between the temporal crests of the frontal bone.

MODALITY. The statistical character of possessing a mode or modes.

MODE. The value or values with highest frequency in a statistical distribution curve.

MONGOLOID. One of the major racial divisions of mankind, centered chiefly in the continent of Asia. The "yellow race" of Blumenbach.

MONGOLOID FOLD. An internal epicanthic eyefold common among mongoloids, and creating a slant-eyed or slit-eyed appearance.

MORPHOLOGICAL CHARACTERS. Non-metrical, observational attributes of the human body.

MORPHOLOGICAL FACE HEIGHT. The height of the face from nasion to menton. Also called total face height and nasion-menton height.

MORPHOLOGICAL UPPER FACE HEIGHT. The height of the face from nasion to alveon or prosthion; on the living, to the lower border of the gums between the two upper median incisors. Also called simply upper face height.

MOUSTERIAN. The Middle Palaeolithic culture associated in western Europe with Neanderthal man.

MUTATION, MUTATIVE. An abrupt evolutionary change of the type postulated by DeVries.

NAQADA. A Predynastic site in Upper Egypt, from which a large cranial series has been excavated. See p. 95.

NASAL INDEX. $\frac{\text{Nose breadth} \times 100}{\text{Nose height}}$.

NAŠILI. A form of Indo-European speech employed in Asia Minor during the Bronze Age. See p.135.

NASIO-BREGMATIC ARC. The distance, on the external surface of the skull in a sagittal line, between nasion and bregma; the sagittal arc of the frontal bone.

NASION. The midpoint on the naso-frontal suture; the root of the nose.

NASION DEPRESSION. The depression in the facial profile below glabella, in the region of nasion; or the root of the nose.

NASION-MENTON HEIGHT. The total or morphological face height. See morphological face height.

NASO-LABIAL FOLDS. The creases running from the nasal wings to the corners of the mouth, and delimiting the area of the integumental upper lip.

NATUFIAN. A Mesolithic culture of Palestine. See p. 61.

NAVETA. A type of long barrow found in the Balaeric Islands.

NEGROID. One of the major divisions of mankind, centered in the continent of Africa.

NEOLITHIC. See p. 78, 1st paragraph.

NORDIC. A blond branch of the greater Mediterranean race, created by the mixture of Corded and Danubian elements, and divided into several subtypes. See p. 292. Unfortunately this term is also used by archaeologists to designate a specific Neolithic cultural complex, without racial implication.

NORDICISM. The misuse of racial terminology for political purposes, based on the unproved assumption that Nordics are superior in mental and moral attributes to members of other races.

NORIC. A blond, Dinaricized Nordic. See p. 293.

NORMAL PROBABILITY CURVE. See bell-shaped curve.

NORTHWESTERN. A name given by Deniker to a blue-eyed dark-haired racial element in Ireland, which he considered to be a segment of the Atlanto-Mediterranean race. See p. 283.

NOSE HEIGHT. The height of the nose; on the skull, from nasion to the lower borders of the piriform opening; on the living, from nasion to the lowest point on the posterior border of the nasal septum, where it joins the upper lip.

NURAGHE. A type of corbelled stone tower of Bronze Age date found in Sardinia.

OCCIPITAL. Pertaining to the occiput, the bone which extends from the foramen magnum to lambda and which forms the lower posterior portion of the brain case.

OCCIPITAL FLATTENING. A vertical flattening of the occipital bone below lambda; in some cases of hereditary and in others of artificial causation.

OCCIPITAL TORUS. A pronounced ridging of the superior nuchal line of the occiput.

OLD STONE AGE. The Palaeolithic.

OLOGENESIS. An evolutionary theory originated by Rosa and expounded by Montandon. See p. 287.

OPHYRON. An arbitrary point on the median sagittal line of the frontal bone, immediately above, and usually posterior to, glabella.

OPISTHION. The midpoint on the posterior border of the foramen magnum.

ORANIAN. An archaeological culture of western Algeria and of Morocco, during Late Pleistocene and Early Post-Pleistocene times. See p. 39.

ORBIT. The bony eye socket.

ORIENTAL. Deniker's name for an eastern European racial type designated in this work as Neo-Danubian. See pp. 282–283.

ORTHOCEPHALIC. Possessing a length-height index on the skull of 74.9 or under; on the living of 62.9 or under; relatively low-headed.

ORTHOGNATHOUS. Straight-jawed, as opposed to prognathous.

OSTEOLOGY. The scientific study of bones.

OSTERDAL TYPE. The classic Iron Age Nordic, as found today in the eastern valleys of Norway.

OSTEUROPID. Von Eickstedt's name for the Neo-Danubian and East Baltic racial entities.

PAEDOMORPHIC. Child-like in bodily form, a partial synonym of foetalized and infantile.

PAINTED POTTERY. A widespread type of Neolithic pottery widely distributed in Asia and coming into Europe in Danubian II. See p. 105.

PALAEASIATIC. A linguistic term designating the non-Altaic languages of eastern Siberia. The word is also applied by extension to speakers of these languages.

PALAEOLITHIC. The age of chipped stone; chronologically synchronous, in most if not all of the Old World, with the Pleistocene.

PALATAL TORUS. A thickening and downward projection of the central, sagittal line marking the junction of the two sides of the palate.

PALPATION. Feeling with the finger or fingers to locate anatomical landmarks.

PALPEBRAL OPENING. The distance between the eyelids when the eye is open.

PAPUAN. Pertaining to New Guinea—in the racial sense, a prominent-nosed, fuzzy-haired, black-skinned Oceanic negroid, probably of composite origin.

PARIETAL. The parietal bones, which lie on either side of the sagittal suture of the skull, form the upper central portion of the cranial vault.

PASSAGE GRAVE. See corridor tomb.

PERMIAN. A sub-family of Finno-Ugrian.

PHALANGES. The bones of the fingers and toes.

PHRYGIANS. An Indo-European-speaking people who invaded Asia Minor from the Balkans during the early part of the first millennium B.C. See p. 136.

PILASTER (OF FEMUR). A longitudinal bony crest on the posterior surface of the thigh bone.

PILE-DWELLING. Czekanowski's name for a hypothetical Mediterranean-Alpine hybrid race. See p. 288.

PILOUS. Pertaining to hair.

PIRIFORM OPENING. The aperture of the nasal passages in the facial skeleton.

P-KELTIC. The Kymric branch of the Keltic linguistic family, including Welsh, Cornish, Breton and all known Continental forms spoken in antiquity. See pp. 186–187.

PLEISTOCENE. See p. 1, footnote 1; also p. 18, footnote 3.

PLUVIAL PERIOD. A long period of exceptional rainfall in regions remote from centers of glaciation, and considered by some geologists to have coincided with maximum glacial advances elsewhere.

POLLEN-ANALYSIS. A specialized study by which palaeobotanists date sites or specimens, especially in the Baltic Mesolithic. See p. 74.

PONTIC. A variety of Mediterranean or Atlanto-Mediterranean, so named by Bunak. It is concentrated in Bulgaria and in the Rumanian lowlands: it also is found in the Caucasus and Ukraine and westward sporadically as far as Germany, Poland, and Lithuania.

POOLING. Combining samples for statistical purposes.

POST-MORTEM DEFORMATION. Deformation of skulls after burial, owing to earth pressure or other causes. See p. 119.

PRE-SLAVIC. Czekanowski's name for the type called in this work Neo-Danubian.

PRIMATE. The mammalian order to which belong lemurs, tarsiers, monkeys, apes, and men.

PROBABLE ERROR. See p. 246.

PROGNATHISM. A forward projection of the jaws.

PROSTHION. See Alevon.

PROTO-GEOMETRIC. A pottery name applied to an archaic, Iron Age cultural period in Greece.

PSUEDO-MONGOLOID FOLD. A term coined by Seligman to designate a class of internal eyefold found among Sudanese negroes.

PUBIS, PUBIC. The region of the pubic symphysis, immediately anterior to the external genitalia. Pubic hair is the sex-linked pilous covering of the genital region.

PUPIL. The circular aperture in the center of the iris of varying diameter, depending on the brightness of the light to which the eye is exposed.

PUSHTU. A division of the Iranian branch of Satem Indo-European speech, spoken mostly in eastern Iran, in Afghanistan and in northwestern India.

PYGMY. The negrito group, from the Congo to New Guinea, presumably one of the major racial divisions of mankind.

PYKNIC. The first component designated by students of constitutional types; round, broad in proportion to length, possessing of a small surface in relationship to total bulk.

Q-KELTIC. The Goidelic branch of the Keltic linguistic group, including Irish and Scots Gaelic and Manx. See pp. 186–187.

QUERN. A hand mill for grinding grain.

RACE. See pp. 3 seq.

RACIOLOGIST. A student of race, sometimes used in the political sense.

RADIUS. The rotating long bone of the lower arm.

RECENT. Post-Pleistocene, post-glacial time.

RECOMBINATION. The genetic union of traits originally associated with diverse parental stocks.

REDUCED TYPE. A racial type which has grown smaller than its ancestral prototype and has consequently changed in certain proportions as a result of this size reduction.

REËMERGENCE. The reappearance of an older racial entity through the vehicle of a mixed population by the mechanism of differential selection.

REIHENGRÄBER. Early Germanic cemeteries, of pre-Christian times. Also a term applied to the Germanic form of Nordic skull associated with them.

RELATIVE SHOULDER BREADTH. $\frac{\text{Biacromial diameter} \times 100}{\text{Stature}}$.

RELATIVE SITTING HEIGHT. $\frac{\text{Sitting height} \times 100}{\text{Stature}}$. The ratio of sitting height to stature.

RELATIVE SPAN. $\frac{\text{Span} \times 100}{\text{Stature}}$. The ratio of span to stature.

RETINA. The posterior surface of the main eye chamber, sensitized for the reception of images cast upon it by the lens.

ROMANSCH. The Rhaeto-Roman languages of the Bünder Oberland in the canton of Grisons Switzerland.

ROUND BARROW. A tumulus erected over a simple grave. This was the characteristic burial type in Bronze Age Britain. See p. 159.

RUFUS, RUFOSITY. Red-haired.

SAMPLE, SAMPLING. In statistical parlance, the random selection of a part of a population to represent the whole.

SATEM. One of the two primary divisions of the Indo-European linguistic stock, based on the consonantal shift from K to S.

SCAPULA. The shoulder blade.

SCHWEINHIRTENKULTUR. See Swineherds.

SEBILIAN. A Mesolithic culture of Upper Egypt. See p. 92.

SEMITIC. A linguistic stock including Hebrew, Babylonian, Arabic, Ethiopic, among other languages.

SHOE-LAST CELT. A flint hoe-blade used by the Neolithic Danubians.

SHORT CIST. A Bronze Age burial vault of Ireland and Scotland.

SIGMOID NOTCH. The curved upper surface of the ascending ramus of the mandible between the coronoid process and the condyle.

SITTING HEIGHT. The height of the human body from chair to vertex, taken while the subject is sitting erect.

SOLUTREAN. The second of the three cultural periods of the Upper Palaeolithic in western and central Europe.

SOMATIC. When used by students of constitutional types, this word indicates their second component, the "athletic," or thick-set, heavily muscled, square; otherwise simply "pertaining to the body."

SPAN. The distance between the two middle finger tips when the arms are stretched in opposite directions; maximum arm stretch.

SPHINCTERS. Concentric "puckering" muscles, as in the iris and around the anus.

STANDARD DEVIATION. See p. 246.

SUB-ATLANTIC. The latest of the post-glacial climatic periods of northwestern Europe, beginning about 500 B.C. We are still in it.

SUB-BOREAL. The warm, dry climatic period in northwestern Europe which lasted from approximately 2500 to 500 B.C.

SUB-BRACHYCEPHALIC. Possessing a cephalic index of 80.0 to 82.0; moderately round-headed.

SUB-NORDIC. Deniker's name for a racial group which would fall partly in the East Baltic and partly in the Neo-Danubian categories of the present book. See p. 283.

SUPERCILIARY. The superciliary region is the browridge area, literally the region above the eyelids.

SUPRAMASTOID RIDGES. Bony crests above the mastoids, usually on the temporal bones alone, but extending in some cases onto the parietals.

SUPRAORBITAL REGION. The area of the frontal bone immediately above the orbits.

SUPRAORBITAL TORUS. An exaggerated form of browridge in which the prominence is continuous.

SWINEHERDS. A word used by Menghin to designate the Neolithic invaders who presumably entered western Europe by way of North Africa and Spain.

SYMPHYSIAL HEIGHT (OF MANDIBLE). The depth of the mandible from the point between the two lower median incisors to menton.

TACHE NOIRE. An area of low stature, supposedly due to malnutrition, or to environmental causes in general.

TALAYOT. A type of corbelled stone tower, of Bronze Age date, found in the Balearic Islands.

TANGED POINT. A flint point tanged for hafting; found in the Aterian of North Africa and in some of the Epipalaeolithic cultures of northwestern Europe.

TARDENOISIAN. A microlithic culture of the European Mesolithic, of North African or Asiatic inspiration, or derived from both sources.

TASIAN. An early Neolithic culture of Upper Egypt. See p. 93.

TAURODONTISM. A dental condition characterized by the enlargement of the pulp cavities.

TAXONOMY. Zoölogical classification into species, genera, etc.

TEMPORAL. One of the paired bones of the side of the skull which contains the auditory mechanism and includes the mastoid process and the posterior segment of the zygomatic arch.

TEMPORAL MUSCLE. The muscle which passes from the coronoid process of the mandible under the zygomatic arch to its area of attachment on the frontal, temporal and parietal bones.

TERP. A habitation mound built on seasonally flooded ground in the Netherlands in the days before the dykes were erected.

TERREMARE. A type of moated village built in northeastern Italy during the Late Bronze Age.

TEUTONIC. Ripley's word to designate the Nordic race.

TEUTO-NORDIC. Paudler's name for the Germanic-Nordic type. See p. 285.

TIBIA. The inner and thicker of the two long bones of the lower leg.

TOKHARIAN B. An extinct Centum Indo-European language spoken in the early centuries of the present era in Chinese Turkestan.

TORUS. One of the several bony ridges or crests which may occur on the cranium.

TOTAL FACE HEIGHT. See morphological face height.

TRAGION. A point on the upper side of the fleshy projection, called tragus, which lies immediately in front of the ear hole. This point is used as a landmark for taking auricular head height on the living.

TRANSVERSE CIRCUMFERENCE. The circumference of the skull across the two porions (ear holes) and bregma.

TREPHINE. To remove a portion of the skull-vault surgically.

TRØNDELAGEN TYPE, TRØNDER TYPE. A variety of Nordic with an excessive Corded element and Upper Palaeolithic mixture.

TUMULUS, TUMULUS. A burial mound. In the late Bronze Age of central Europe there was a specific Tumulus culture.

TUNGUSIC. A mesocephalic mongolid racial type common among the living Tungus and the historic Huns.

TURANID. Von Eickstedt's name for a hybrid mongoloid-white racial type found commonly among certain Turkish-speaking peoples of central Asia.

TYMPANIC PLATE. That portion of the temporal bone which forms the anterior border of the auditory opening, or bony ear hole.

ULNA. The non-rotating long bone of the lower arm.

UPPER FACE HEIGHT. On the skull, the distance from nasion to alveon; on the living, the distance from nasion to the lowest point on the gums between the two upper median incisors, corresponding as nearly as possible to the measurement on the skull.

UPPER FACIAL INDEX. $\frac{\text{Upper face height} \times 100}{\text{Bizygomatic}}$. Used both on the cranium and on the living.

URAL-ALTAIC. A term designating the two linguistic stocks Uralic and Altaic.

URALIC. A linguistic stock including Samoyedic and Finno-Ugrian. For the divisions of Finno-Ugrian, see p. 339.

URNFIELDS. A group of Late Bronze Age cultures in central Europe, characterized by cremation.

VASCULARITY. Redness of the skin, especially when exposed to the sun and air.

VEDDOID. The racial group to which the Vedda of Ceylon, the Toala of the Celebes, the Shom Pen of the Nicobars, etc., belong; presumably one of the major racial divisions of mankind.

VERTEX. The highest point on a skull when held in the eye-ear plane.

VILLANOVA. An Iron Age culture of northern Italy.

VISTULAN. Deniker's name for a supposed sub-variety of the *Oriental* or Neo-Danubian racial group. See p. 283.

VÖLKERWANDERUNG. The main period of Germanic migrations.

WILTON A. A Mesolithic culture of East Africa, associated with ancestral Bushmen.

WINDMILL HILL. A Neolithic pottery culture of England, supposedly of North African inspiration. See p. 110.

WÜRM. The last of the four Pleistocene glacial advances, now divided into Würm I and Würm II, with the Laufen interglacial between.

ZONED BEAKER. A late Beaker pottery form which shows Corded influence in decoration.

ZYGOMATIC ARCH. The bony arch, formed of portions of the malar and temporal bones, which encloses the temporal muscles and serves as the upper attachment of the masseter.

Appendix III

LIST OF SERIALS AND THEIR ABBREVIATIONS

Note: Every title of more than one word has been abbreviated. Single word titles such as "Biometrika" and "Man" have been spelled out. Capitals refer to initial letters of words, or of sections of words in German, i.e., RK is equivalent to "Rassenkunde." The use of the lower case refers to consecutive letters within words. Standard abbreviations have been followed when possible.

Abbreviations	*Serials*
AA	American Anthropologist, Menasha, Wis., etc.
AAM	Anthropologischer Ausstellung, Moskau.
AAnz	Anthropologischer Anzeiger, Stuttgart.
AAPP	Annaes scientificos de Academia Polytechnica do Porto, Oporto.
AASF	Annales Academiae Scientiarum Fennicae (Toimituksia Suomen tiedeakatemia), Helsingfors.
AAW	Anzeiger der Akademie der Wissenschaften, Vienna. Philosophisch-historische Klasse.
ACAP	Acts of the 15th International Congress of Anthropology and Prehistoric Archaeology, Coimbre, Porto and Lisbon, 1930. (Published in Paris, 1931.)
ACIA	Actes du congrès de l'Institut International d'Anthropologie. IIme Session, Prague, 1924. IIIme Session, Amsterdam, 1927. (Published in Paris.)
AE	Annals of Eugenics, London.
AEPC	Asociacion Española para el progreso de las ciencias.
AF	Antropológiai füzetek, Budapest.
AFA	Archiv für Anthropologie, Brunswick.
AFSA	Anzeiger für schweizerische Altertumskunde, Zurich.
AG	Annales de Géographie, Paris.
AH	Archaeologia Hungarica, Budapest.
AIPH	Archives de l'Institut de Paléontologie Humaine, Paris.
AJA	American Journal of Archaeology, Concord, N. H.
AJKS	Archiv der Julius Klaus-Stiftung für Vererbungsforschung, Sozialanthropologie, und Rassenhygiene, Zurich.
AJPA	American Journal of Physical Anthropology, Philadelphia, Pa.
AJSL	American Journal of Semitic Languages and Literatures, Chicago, Ill.
AMFM	Anthropological Memoirs of the Field Museum of Natural History, Chicago, Ill.
AMSE	Actas y Memorias de la Sociedad Española de Antropologia, Etnografia, y Prehistoria, Madrid.

AMSL	Archives des Missions Scientifiques et Litteraires, Paris.
ANAW	Archiwum Nauk Antropologicznych. Towarzystwo naukowe warszawskie, Warsaw.
ANOH	Aarbøger for Nordisk Oldkyndighed og Historie, Copenhagen.
Anth	L'Anthropologie, Paris. (1890–; formerly Revue d'Ethnographie, Revue d'Anthropologie RDAP; and Materiaux pour l'histoire de l'Homme.)
AnthPr	Anthropologie, Prague.
Anthropos	Anthropos, Vienna.
Antiquity	Antiquity, Southampton, England.
AntrK	Antropologiĭa, Kiev.
AntrM	Antropolozhiĭa, Moscow.
ANYA	Annals of the New York Academy of Sciences, N. Y.
APA	Archivio per l'antropologia e la etnologia, Florence.
APAM	Anthropological Papers of the American Museum of Natural History, N. Y.
APAW	Abhandlungen der Preussische Akademie der Wissenschaften, Berlin. Philosophisch-historische Klasse.
APL	Archivo de Prehistoria Levantina, Valencia.
APSL	Académie Polonaise des Sciences et des Lettres, Krakow. (The Bulletin of this Society is BAPS.)
AR	Anthropological Review, London.
ARAL	Atti Regia Accademia dei Lincei, Rome.
ARBS	Annual Report of the British School at Athens, London.
Archaeologia	Archaeologia, Copenhagen.
ARGB	Archiv für Rassen- und Gesellschaftsbiologie, einschliesslich Rassen- und Gesellschafts-hygiene, Berlin and Munich.
ARSI	Annual Reports of the Smithsonian Institution, Washington, D. C. (The Miscellaneous Collections of this Institution are MCSI.)
ASAG	Archives suisses d'anthropologie générale, Geneva.
ASE	Actas de la Sociedad Española de Historia Natural, Madrid.
ASRA	Atti della societa Romana di antropologia, Rome.
ATNL	Archiwum Towarzystwa Naukowego we Lwowie, Lemberg.
ATS	Antiqvarisk Tidskrift for Svérige, Stockholm.
AZM	Antropologicheskiĭ Zhurnal, Moscow.
BAC	Bulleti de l'Associació catalana d'antropologia, etnologia i prehistoria, Barcelona.
BAPS	Bulletin de l'Académie Polonaise des Sciences et des Lettres, Krakow.
BASP	Bulletin of the American School of Prehistoric Research, Old Lyme, Conn.
BAUB	Beiträge zur Anthropologie und Urgeschichte Bayerns, Munich.
BBMF	Bulletin of the Boston Museum of Fine Arts, Boston.
BGSC	Bulletin of the Geological Society of China, Peiping.
BIKB	Bericht des Internationalen Kongresses für Bevölkerungs-wissenschaft, Berlin, 1935. (Published in Munich, 1936.)

Biometrika	Biometrika, London.
BIPH	Bulletin et Archives de l'Institut de Paléontologie Humaine, Paris.
BJ	Biochemical Journal, Liverpool and Cambridge.
BMSA	Bulletin et mémoires de la Société d'anthropologie de Paris, Paris.
BNAV	Bijblad der Nederlandsche anthropologidsche Vereeniging, Leiden.
BRAH	Boletin de la Real Academia de la Historia, Madrid.
BRGK	Bericht der römisch-germanish Kommission, Leipzig and Berlin.
BRSG	Boletin de la Real Sociedad Geografica de Madrid, Madrid.
BSAB	Bulletin de la Société d'anthropologie de Bruxelles, Brussels.
BSAL	Bulletin de la Société d'Anthropologie de Lyon, Lyons.
BSAP	Bulletin de la Société d'Anthropologie de Paris, Paris.
BSGA	Bulletin der Schweizerischen Gesellschaft für Anthropologie und Ethnologie, Bern.
BSPF	Bulletin de la Société préhistorique Française, Paris.
BSRB	Bulletin de la Société royale belge de géographie, Brussels.
BSRS	Buletinul, Societatea romăna de sciinte din Bucurescĭ, Bucharest.
BSSM	Bulletin de la Société Scientifique et Médicale de l'Ouest, Rennes.
BTTK	Belleten Türk Tarih Kurumu, Ankara.
BUMP	Bulletin of the University Museum, University of Pennsylvania, Philadelphia, Pa.
BZB	Biochemische Zeitschrift, Berlin
BZL	Biologisches Zentralblatt, Leipzig.
CEAP	Contribuïções para o Estudo da Antropologia Portuguesa, Universidad de Coimbra, Coimbra.
CIPP	Comitato Italiano per lo studio dei problemi della popolazione, Rome.
CL	Český Lid, Prague.
COIC	Communications of the Oriental Institute of Chicago University, Chicago, Ill. (The Publications of this Institute are POIC.)
CRAS	Comptes-rendus des Séances de l'Académie des Sciences, Paris.
CRCA	Compte-rendu, Session du Congrès International d'Anthropologie et d'Archéologie Préhistorique, 8me session, Budapest, 1876; 11me session, Moscow, 1892; 14me session, Geneva, 1912.
CRIC	Compte-rendu, International Congress of Anthropological and Ethnological Sciences, London, 1934.
CRSB	Comptes-rendus des Séances de la Société de Biologie, Paris.
DESM	Dictionnaire Encyclopédique des sciences medicales, Paris.
DGT	Dansk Geografisk Tidsskrift, Copenhagen.
Dolgozatok	Dolgozatok, Szeged. Tudományegyetem. Archaeologiai intézetébol, Budapest.
DRK	Deutsche Rassenkunde, Jena.
EA	Eesti Arst, Tartu.
ESA	Eurasia Septentrionalis Antiqua, Helsingfors.
Ethnographie	L'Ethnographie, Paris.
Ethnolog	Ethnolog, Ljubljana.
Fennia	Fennia, Helsingfors.

FKVA	Fornvännen, Kungliga Vitterhets historie oche antiqvitets akademien, Stockholm.
FUL	Förhandlingar, Uppsala Läkareförening, Uppsala.
FVO	Forhandlinger, Videnskabsselskab i Oslo, Mat.-Nat. Klasse, Oslo (formerly Kristiana).
Globus	Globus, Brunswick.
GM	The Geographical Magazine, London.
GR	The Geographical Review, New York.
GT	Geografisk Tidsskrift, Copenhagen.
HAS	Harvard African Studies, Cambridge, Mass.
HB	Human Biology, Baltimore.
Hesperis	Hespéris, Paris.
HKSV	Handlingar Kungliga Svenska Vetenskapsakademiens, Stockholm.
Homme	L'homme, Journal Illustré des Sciences Anthropologiques, Paris.
HTR	Henderson Trust Reports, Edinburgh.
IILE	Izvestiîa Imperatorskago Obshchestvo lîuviteleĭ estestvoznaniîa, antropologïi, i etnografïi, Moscow.
INJ	Irish Naturalists' Journal, Belfast.
ITL	Izdaniîa Tashkentskago Obshchestvo dlîa izucheniîa Tadzhikistana i iranskikh narodnosteĭ za ego predelami, Tashkent.
JA	Journal of Anatomy, London.
JAOS	Journal of the American Oriental Society, New Haven.
JAPL	Journal of Anatomy and Physiology, London.
JGAS	Journal of the Galway Archaeological and Historical Society, Galway.
JNVH	Jahrbuch des nordfriesisches Verein für Heimatkunde und Heimatliebe, Husum.
JRAI	Journal of the Royal Anthropological Institute of London, London.
JSAI	Journal of the Royal Society of Antiquaries of Ireland, Dublin.
JVST	Jahresschrift für die Vorgeschichte der Sächsisch-Thüringischen Länder, Halle.
KAWA	Koninklijk Akademie van Wetenschappen, Amsterdam. Afdeeling naturkunde.
KDGA	Korrespondenzblatt der Deutsche Gesellschaft für Anthropologie, Ethnologie, und Urgeschichte, Brunswick.
KMV	Kazanskii Muzeinii Vestnik, Kazan.
Kosmos	Kosmos, Rozprawy Polskiego Towarzystwa Przyrodnikow imienia Kopernika, Lwow.
Language	Language, Journal of the Linguistic Society of America, Baltimore.
LMB	Logan Museum Bulletin. Beloit College, Beloit, Wisconsin.
LUA	Lunds Universitets Årsskrift, Lund.
LUR	Latvijas Universitates Raksti, Riga.
MAAA	Memoirs of the American Anthropological Association, Menasha, Wis., etc.
MAAE	Materyały antropologiczno-archeologiczne i etnograficzne, Komisya antropologiczna, Akademja umiejętnosci, Krakow.

MAGW	Mitteilungen der Anthropologischen Gesellschaft in Wien, Vienna.
MAGZ	Mitteilungen des Antiquarischen Gesellschaft in Zurich, Zurich.
Man	Man (Published by the Royal Anthropological Institute), London.
MannusB	Mannus-Bibliothek, Wurzburg.
MannusZ	Mannus, Zeitschrift für Vorgeschichte, Wurzburg.
MASB	Memorie dell' Accademia delle scienze dell' Istituto di Bologna, Bologna.
MASI	Memoirs of the Archaeological Survey of India, Calcutta.
MASL	Memoirs read before the Anthropological Society, London.
MBM	Memoirs of the Bernice Pauahi Bishop Museum, Honolulu.
MCSI	Miscellaneous Collections of the Smithsonian Institution, Washington, D. C.
MDSS	Memoires et documents de la Société Savoisienne d'histoire et d'archeologie, Chambéry.
MEM	Mensch en Maatschappij, Groningen.
MKEI	Materialy Komissia ekspeditsionnykh issledovanii, Akademiîa Nauk SSSR, Leningrad.
MKIS	Materialy Osobogo Komissia po Issledovaniiû Soiuznikh i Autonomiikh Respublik, Akademiîa Nauk, SSSR, Leningrad.
MMSC	Mitteilungen des K. und K. Militär-Sanitäts-Comités, Vienna.
MODA	Meddelelser om Danmarks Antropologi, Copenhagen.
MOG	Meddelelser om Grønland, Copenhagen.
MOKI	Materialy Osobyĭ komitet po issledovaniiû soiûznikh i avtonomnykh respublik, Akademiia nauk SSSR, Leningrad.
MSAE	Memorias de la Sociedad Española d'Antropologia, Etnografia, y Prehistoria, Madrid.
MSAP	Mémoires de la Société d'Anthropologie de Paris, Paris.
MSGP	Mémoires de la Société de Geographie, Paris.
MSSR	Memoriile Secţiuni Ştiinţifice, Academia Română, Bucuresti.
NDSN	Neue denkschriften der schweizerischen naturforschende Gesellschaft, Zurich.
NMN	Nyt Magazin for Naturvidenskaberne, Oslo.
NMNM	Néprajzi osztalyának értésitöje, Magyar nemzeti muzeum, Budapest.
OFVS	Oversigt af förhandlingar, Finska Vetenskaps-Societeten, Helsinki.
OMM	Opisanie Minusinskogo Muzeîa, Minussinsk, 1900.
PAAS	Proceedings of the Anatomical and Anthropological Society of Aberdeen University, Edinburgh.
PAn	Przegląd Antropologiczny, Posen.
PAr	Przegląd Archaeologiczny, Posen.
PAUB	Publications of the American University of Beirut. Social Science Series, Beirut.
PBSS	Proceedings of the Bristol Spelaeological Society, Bristol.
PCAS	Proceedings of the Cambridge Antiquarian Society, Cambridge.
PCZA	Proceedings of the 4th Congress of Zoologists, Anatomists, and Histologists of the USSR, Kiev, 1930.

PGA	Proceedings of the Geologists' Association, London.
PICA	Proceedings of the 23rd International Congress of Americanists, New York, 1928. (Published in N. Y., 1930.)
PICP	Proceedings of the 1st International Congress of Prehistoric and Protohistoric Sciences, London, 1932. (Published in London, 1934.)
PIIA	Publications de l'Institut Internationale d'Anthropologie, Paris.
PMP	Peabody Museum Papers, Harvard University, Cambridge, Mass.
POIC	Publications of the Oriental Institute of Chicago University, Chicago, Ill.
Portugalia	Portugalia, Oporto.
PPS	Proceedings of the Prehistoric Society, Cambridge.
PPSC	Proceedings of the 5th Pacific Science Congress, Toronto, 1933.
PRAO	Protokoly, Russkoe antropologicheskoe obshchestvo, St. Petersburg.
PRIA	Proceedings of the Royal Irish Academy, Dublin.
PSAS	Proceedings of the Society of Antiquaries of Scotland, Edinburgh.
PZ	Praehistorische Zeitschrift, Berlin.
QRB	Quarterly Review of Biology, Baltimore, Md.
QRMS	Quarterly Journal of the Royal Meteorological Society, London.
RA	Revue Anthropologique, Paris. (1912–, formerly Revue de l'École d'Anthropologie de Paris, REAP.)
RAJ	Russkiĭ antropologicheskiĭ zhurnal, Moscow.
RBAA	Report of the British Association for the Advancement of Science, London.
RCA	Rozpravy Česká Akademie Františka Josefa, Prague.
RDAP	Revue d'Anthropologie, Paris. (1872–89; continued as L'Anthropologie, Anth.)
RDAR	Rivista di Antropologia, Rome.
Real	Reallexikon der Vorgeschichte, edited by Max Ebert, 15 vols., Berlin, 1924–32.
REAP	Revue de l'École d'anthropologie de Paris. (1891–1911, continued as Revue Anthropologique, RA.)
REHF	Revue des Études Hongroises et Finno-ougriennes, Paris.
RP	Revue Préhistorique, Paris.
RPN	Rudolf Pöchs Nachlass, Serie A. Physische Anthropologie, Vienna.
RSBH	Reports of St. Bartholomew's Hospital, London.
SAM	Severnaîa Aziîa, Moscow. (Title changed to Sovietskaîa Aziîa.)
SAWV	Sitzungsberichte der Akademie der Wissenschaften, Vienna. Philosophisch-historische Klasse.
Science	Science, Lancaster, Pa.
SISK	Skrifter, Institutet for Sammenlignende Kulturforskning, Oslo. Serie B: Skrifter.
SKNV	Skrifter af det Kongelige Norske Videnskabers Selskabs, Trondheim.
Skythika	Skythika, Prague.

SM	Scientific Monthly, Lancaster, Pa.
SNVO	Skrifter utgitt av det Norske videnskaps-akademi i Oslo, I, Mat. Naturv. Klasse, Oslo (formerly Kristiana).
SPFM	Spisy Přírodovědecká Fakulta Masarykova, Brno Universita, Brünn.
STNW	Sprawozdania Towarzystwa Naukowego Warszawskiego, Warsaw. (Société des Sciences et des Lettres de Varsovie.)
Swiatowit	Światowit, Warsaw.
TAM	Türk Antropologi Mecmuasi, Istanbul.
TBFC	Transactions of the Buchan Field Club, Peterhead, Scotland.
TESE	Trudy Îugozapadnyĭ otdîel, Etnograficheskiĭ-statisticheskiĭ ekspeditsiĭ v zapadno-russkiĭ kraĭ. Gosudarstvennoe russkoe geograficheskoe obshchestvo, Leningrad.
TESL	Transactions of the Ethnological Society of London, London.
TIAE	Travaux de l'Institut d'anatomie et d'embryologie, Faculté de médecine de Bucarest, Bucharest.
TKIP	Trudy Komissiîa po izucheniîu plemennogo sostava naseleniîa Rossii, Akademiîa nauk SSSR, Leningrad.
TKU	Trudy, Kazan. Universitet Obshchestvo estestvoispytaleleĭ, Kazan.
TPNW	Towarzystwo Przyjacioł Nauk w Wilnie, Vilna.
TRSE	Transactions of the Royal Society of Edinburgh, Edinburgh.
TSPA	Trabalhos da Sociedade portuguêsa de antropologia e etnologia, Oporto.
TVMA	Trudy antropologicheskoe obshchestvo, Voenno-meditsinskaîa akademiia, St. Petersburg.
TYNU	Transactions of the Yorkshire Naturalists' Union, Hull, England.
VGPA	Verhandlungen der Gesellschaft für Physische Anthropologie, Stuttgart.
VMZ	Voenno-Meditsinskiĭ Zhurnal, St. Petersburg.
VNGZ	Vierteljahrsschrift der Naturforschende Gesellschaft, Zurich.
VUR	Volk und Rasse, Munich.
WAnt	Wiadomości Antropologiczne, Warsaw.
WArc	Wiadomości Archaeologiczne, Warsaw.
WBKL	Wiener Beiträge zur Kulturgeschichte und Linguistik, Vienna.
WMBH	Wissenschaftliche Mitteilungen aus Bosnien und der Herzegowina, Vienna.
WPZ	Wiener Prahistorische Zeitschrift, Vienna.
Ymer	Ymer, Stockholm.
ZBFA	Zentralblatt für Anthropologie, Brunswick.
ZDSJ	Zeitschrift für Demographie und Statistik der Jüden, Berlin.
ZFAE	Zeitschrift für Anatomie und Entwickelungsgeschichte, Leipzig.
ZFE	Zeitschrift für Ethnologie, Berlin.
ZFKL	Zeitschrift für Konstitutionslehre. Munich, Berlin, etc.
ZFMA	Zeitschrift für Morphologie und Anthropologie, Stuttgart.
ZFRK	Zeitschrift für Rassenkunde, Berlin and Leipzig.
ZFRP	Zeitschrift für Rassenphysiologie, Munich.

ZGTK	Zhurnal geologo-geografichnogo tsiklu, Kiev.
ZIGO	Zapiski Imperatorskago russkoe Geograficheskoe Obshchestvo, po otdi͡eleniiu͡ statistiki, St. Petersburg.
ZRGO	Zapiski Otdi͡elenie statistiki, Etnograficheskiĭ-statistcheskiĭ ekspeditsiĭ v zapadno-russkiĭ kraĭ. Gosudarstvennoe russkoe geograficheskoe obshchestvo, Leningrad.
ZVAK	Zapiski Vseukraïns'kiĭ arkheologichniĭ Komitet, Vseukrains'ka akademii͡a nauk, Kiev.
ZWAK	Zbior wiadomości do antropologii krakowéj, Komisya antropologiczna, Akademija umiejetności, Krakow.

Appendix IV

LIST OF BOOKS

AICHEL, OTTO, Der deutsche Mensch, Jena, 1933.

AMAT, C., Le Mzab et les Mzabites, Paris, 1886.

AMMON, O., Anthropologische Untersuchungen der Wehrpflichtigen in Baden, Hamburg, 1890.

ANONYMOUS, Anthropometric Data from Baluchistan, Ethnographic Survey of India, Calcutta, 1908.

ARANZADI, T. DE, El Pueblo Euskalduna, San Sebastian, 1889.

—, and BOSCH GIMPERA, P., Excavacio de Sepulcres Megalitics, Barcelona, 1920.

BARONOV, S. F., BUKEĬKHAN, A. N., and RUDENKO, S. I., Kazaki. Anthropologicheskie ocherki. MKIS, Vip. 3, Leningrad, 1927.

BARONS, S. W., A Social and Religious History of the Jewish People, New York, 1937.

BATES, O., The Eastern Libyans, London, 1914.

BAUR, E., FISCHER, E., and LENZ, F., Human Heredity, New York, 1931.

BAXTER, J. H., Statistics, Medical and Anthropological, U. S. Army, Washington, D. C., 1875. 2 vols.

BEDDOE, J., The Races of Britain, London, 1885.

—, The Physical Anthropology of the Isle of Man, Bristol, 1887.

—, On the North Settlements of West Saxons, London, 1895.

BELLOWS, H. A., Poetic Edda. American Scandinavian Foundation, New York, 1936. (Translation.)

BENHAZERA, M., Six Mois chez les Touareg du Ahaggar, Alger, 1908.

BENT, T. J., The Sacred City of the Ethiopians, London, 1893.

BERTHOLON, L., and CHANTRE, E., Récherches Anthropologiques dans la Bérberie Orientale, Lyons, 1913.

BOAS, F., Materials for the Study of Inheritance in Man, New York, 1928.

BOË, J., and NUMMEDAL, A., Le Finnmarkien, SISK, Serie B, Oslo, 1936.

BOULE, M., VALLOIS, H., and VERNEAU, R., with ARAMBOURG, C., Les Grottes Paléolithiques des Beni Seghoual. AIPH, Mémoire 13, Paris, 1934. Deuxième Partie, Anthropologie.

BOWLES, GORDON T., New Types of Old Americans at Harvard, Cambridge, Mass., 1932.

—, Data on Afghanistan and India (unpublished).

BRAY, SIR DENIS, Ethnographic Survey of Baluchistan, Bombay, 1913. 2 vols.

BREIG, A., Eine anthropologische Untersuchung einer schwäbische Alb, DRK, vol. 13, Jena, 1935.

BRENNSOHN, I., Zur Anthropologie der Litauer, Dorpat, 1883.

BRION, M., Attila, the Scourge of God, London, 1929.
BRYN, H., Der nordische Mensch, Munich, 1929.
—, Homo Caesius. SKNV, #2, Trondhjem, 1931.
—, and SCHREINER, K. E., Somatologie der Norweger. SNVO, #1, Oslo, 1929.
BUNAK, V. V., Crania Armenica, Moscow, 1927.
BUXTON, L. H. D., Appendix on the Human Remains Excavated at Kish, in Langdon, S., Excavations at Kish, I, Paris, 1924, pp. 115–125.

CAMERON, JOHN, The Skeleton of British Neolithic Man, London, 1934.
CASTRO, L. de, Nella Terra dei Negus, Milan, 1915.
CHANTRE, E., Récherches Anthropologiques dans l'Asie Occidentale, Lyons, 1895.
—, Récherches Anthropologiques dans l'Afrique Orientale, Egypte, Lyons, 1904.
CHILDE, V. GORDON, The Dawn of European Civilization, London, 1925.
—, The Danube in Prehistory, Oxford, 1929.
—, The Most Ancient East, New York, 1929.
—, The Bronze Age, Cambridge, 1930.
—, New Light on the Most Ancient East, London, 1935.
—, The Prehistory of Scotland, London, 1935.
—, Man Makes Himself, London, 1936.
CLARKE, J. G. D., The Mesolithic Age in Britain, Cambridge, 1932.
—, The Mesolithic Settlement of Northern Europe, Cambridge, 1936.
COMAS, JUAN, Aportaciones al Estudio de la Prehistoria de Menorca, Madrid, 1936.
COON, C. S., Tribes of the Rif. HAS, vol. 9, Cambridge, Mass., 1931.
—, Contribution to the Study of the Physical Anthropology of the Ethiopians and Somalis, MS.
—, The Physical Anthropology of Northern Albania, MS.

DAVENPORT, C. B., and LOVE, A. B., Army Anthropometry, Washington, 1921.
DAVIS, J. B., and THURMAN, J., Crania Britannica, London, 1865.
DECHELETTE, J., Manuel de l'Archaeologie Prehistorique. vol. 3, Celtique et Gallo-Romaine, Paris, 1910.
DE GEER, S., The Kernel Area of the Nordic Race within Northern Europe, in Lundborg, L., and Linders, F., Racial Character of the Swedish Nation, Uppsala, 1926.
DENIKER, J., The Races of Man, New York, 1912.
DIEBOLD, V., Ein Beitrag zur Anthropologie der Kleinrussen, Dorpat, 1886.
DUBNOW, S., Die neueste Geschichte des jüdischen Volkes, 1789–1914, Berlin, 1920–1923.
—, History of the Jews in Russia and Poland, Philadelphia, 1916.
DUVEYRIER, H., Les Touareg du Nord, Paris, 1864.

ECKER, A., Crania Germaniae meridionalis occidentalis, Freiburg, 1863.
EHRICH, R. W., Appendix in Starr, Richard F. S., Nuzi, vol. 1, Cambridge, Mass. (in preparation).
—, Measurements on Bohemians and Moravians (unpublished).
—, Measurements on Montenegrins (unpublished).

EICKSTEDT, E. VON, Rassenkunde und Rassengeschichte der Menschheit, Stuttgart, 1934.

ELLIOT-SMITH, SIR G., Appendix B, in Leakey, L. S. B., The Stone Age Races of Kenya, London, 1935.

ENGBERG, R. M., and SHIPTON, G. M., Notes on the Chalcolithic and Early Bronze Age Pottery of Megiddo. Oriental Institute, Studies in Ancient Oriental Civilization, #10, Chicago, 1934.

EVANS, SIR A., Palace of Minos at Knossus, London, 1921, vol. 1.

FIELD, HENRY, Arabs of Central Iraq, AMFM, vol. 4, Chicago, 1936.

FISCHER, E., Die Rehobother Bastards, Jena, 1913.

FLEURE, H. J., The Races of England and Wales, London, 1923.

FOURNEL, H., Les Berbers, Paris, 1875.

FRANKOWSKA, M. z R., Czazki z Lwowskiej Katedry Łacinskiej z XVII i XVIII w i Lwow, Lemberg, 1925.

FRASETTO, F., Note Anthropologiche Sulla Populazione del Bolognese, Bologna, 1932.

FÜRST, CARL M., Zur Kranologie der Schwedischen Steinzeit. HKSV, #1, vol. 49, Stockholm, 1912.

GALLOWAY, A., The Skeletal Remains of Mapungubwe, in Fouché, L., Mapungubwe, Cambridge, 1937, pp. 127–174.

GARSON, J. G., Appendix in Bent, J. T., The Sacred City of the Ethiopians, New York, 1893.

GAUTIER, E. F., Les Siècles Obscurs dans l'Histoire du Magbreb, Paris, 1927. Sahara, The Great Desert. New York, 1935.

GJESSING, R., Die Kautokeinolappen. SISK, #25, Oslo, 1934.

GLODT, H. R., Melanogenesis, 1936. Thesis in Peabody Museum Library, Harvard University.

GOBINEAU, A. DE, Essai sur l'inégalité des races humaines, Paris, 1853–55.

GÖLLNER, H., Volks- und Rassenkunde der Bevölkerung von Friedersdorf, DRK, vol. 9, Jena, 1932.

GORING, C., The English Convict, London, 1913.

GOROSHCHENKO, K., Kurgannie Cherepa Minusinskago Okruga. OMM, Minussinsk, 1900.

GOULD, B. A., Investigations in the Military and Anthropological Statistics of American Soldiers. Cambridge, Mass., 1869.

GRAY, J., and TOCHER, J. F., The Ethnology of Buchan, Peterhead, Scotland, 1895.

GRAU, R., Die Questenberger, DRK, vol. 11, Jena, 1934.

GREENLEE, R. F., The Association and Interrelation of the Microlithic Cultures of Europe and Africa. Privately printed, 1935.

GRUBE, O., Anthropologische Untersuchungen an Esten, Dorpat, 1878.

GSELL, S., Histoire Ancienne de l'Afrique du Nord, Paris, 1913.

GUHA, B. S., The Racial Affinities of the Peoples of India. Census of India, vol. 1, part III, Simla, 1931.

GÜNTHER, H., Rassenkunde des deutschen Volkes, Munich, 1923.

—, Rassenkunde des jüdischen Volkes, Munich, 1930.

HADDON, A. C. and BROWNE, C. R., The Ethnography of the Aran Islands, Dublin, 1893.
HAECKEL, E. H., Natürliche Schöpfungsgeschichte. 7th ed., 1879.
HALL, H. R. H., and WOOLLEY, C. L., Al-'Ubaid, Ur Excavations. Vol. 1, Oxford, 1927.
HANNESSON, G., Körpermasse und Korperproportionen der Isländer, Reykjavik, 1925.
HATT, G., Notes on Reindeer Nomadism. MAAA, vol. 6, #2, 1919.
HAWES, C. H., and H. B., Crete, the Forerunner of Greece. London and New York, 1909.
HELLICH, B., Praehistorické lebky v Čechách ze Sbírky Musea Království Českého, Praha, 1899.
HERMANN, A., Die deutschen Bauern des Burgenlandes. DRK, vol. 15/16, Jena, 1937.
HESCH, M., Letten, Litauer, Weissrussen. RPN, vol. 3, Vienna, 1933.
HOOTON, E. A., The Ancient Inhabitants of the Canary Islands. HAS, vol. 7, Cambridge, Mass., 1925.
—, Indians of Pecos Pueblo, New Haven, 1930.
—, Up from the Ape, New York, 1931.
—, The American Criminal, Cambridge, Mass., vol. 1, 1938.
HOUZÉ, E., Les indices céphaliques des Flamands et des Wallons, Bruxelles, 1882.
HRDLIČKA, A., The Natives of Kharga Oasis, Egypt. MCSI, vol. 59, #1, Washington, 1912.
—, The Old Americans, Baltimore, 1925.
—, The Skeletal Remains of Early Man. MCSI, vol. 83, Washington, 1930.
HUBERT, H., The Rise of the Celts, London, 1934.
HUGHES, BYRON O., The Physical Anthropology of Native Born Armenians, 1938. Thesis in Widener Library, Harvard University.
HULSE, F. P., The Comparative Physical Anthropology of Andalusians and Cubans, 1934. Thesis in Widener Library, Harvard University.

JANKO, J., Magyar Typuszok, Elsö Sorozat: A Balaton Mellékéröl. Budapest, 1900.
JOCHELSON, W., Peoples of Asiatic Russia, New York, 1928.

KAJAVA, Y., Beiträge zur Kenntnis der Rasseneigenschaften der Lappen Finlands. AASF, ser. A, vol. 25, #1, Helsingfors, 1925.
KAPPERS, C. U. A., The Anthropology of the Near East, PAUB, no. 2, 1932.
—, and PARR, L. W., An Introduction to the Anthropology of the Near East, Amsterdam, 1934.
KASTEIN, J., History and Destiny of the Jews, New York, 1933.
KEITER, F., Schwanzen und die Schlei, DRK, vol. 8, Jena, 1931.
—, Russlanddeutsche Bauern. DRK, vol. 12, Jena, 1934.
KEITH, SIR A., The Antiquity of Man, London, 1916.
—, A Report on the Galilee Skull, in Turville-Petre, F., Researches in Prehistoric Galilee, London, 1927.
—, Report on the Human Remains, Ur Excavations, vol. 1, in Hall, H. R. H., and Woolley, C. L., Al-'Ubaid, Ur Excavations, Oxford, 1927.

—, New Discoveries Relating to the Antiquity of Man, New York, 1930.
—, and KROGMAN, W. M., Appendix I, in Thomas, B., Arabia Felix, New York, 1932.
KENDRICK, T. O., and HAWKES, C. F. C., Archaeology in England and Wales, 1914–1931. London, 1932.
KHANIKOFF, N., Mémoire sur l'Ethnographie de la Perse. MSGP, Paris, 1866.
KLENKE, W., and SCHEIDT, W., Niedersachsische Bauern. DRK, vol. 1, Jena, 1929.
KLENKE, W., Die Deutsche und ihre Nachbarvölker, Munich, 1929.
KOSSINNA, G., Die Indogermanen. MannusB, #26, Wurzburg, 1926.
—, Ursprung und Verbreitung der Germanen. MannusB, #6a, Wurzburg, 1928.
KROGMAN, W. M., Cranial Types from Alishar Hüyük, in Osten, H. H. von der, The Alishar Hüyük. POIC, part IV, #30, Chicago, 1937, pp. 213–293.

LAMMENS, H., Islam, Beliefs and Institutions, New York, 1926.
LANSEL, P., The Raeto-Romans, Chur, 1937.
LARSEN, C. F., Om Jaedertypen. SNVO, #4, Oslo, 1900.
LAWRENCE, COL. T. E., The Seven Pillars of Wisdom, New York, 1935.
LAUFER, B., The Reindeer and its Domestication. MAAA, vol. 4, #2, 1917.
LEAKEY, L. S. B., The Fossil Races of Kenya, Oxford, 1935.
—, The Stone Age Races of Kenya, London, 1935.
—, Stone Age Africa, Oxford, 1936.
LE PONTOIS, BERNARD, Le Finistère préhistorique, ACIA, IIIme Session, Amsterdam, 1927, pp. 9–311.
LIVI, R., Antropometria Militare, Rome, 1896. 2 vols.
LORIMER, D. L., The Burushaski Language. SISK, Oslo, 1935.
LUNDBORG, H., and LINDERS, F. J., The Racial Character of the Swedish Nation, Uppsala and Stockholm, 1926.
LUSCHAN, F. VON, and PETERSEN, E., Reisen in Lykien, Milyas, und Kibyratis. Vienna, 1889.
LUSCHAN, F. VON, Über eine Schädelsammlung von den Canarischen Inseln, in Meyer, H., Die Insel Teneriffe, Leipzig, 1896.

MACCURDY, G. G., Human Origins, New York, 1924. 2 vols.
MALEŠ, B., Antropoloska Ispitivanja, Belgrad, 1932.
MARGOLIS, M., and MARX, A., History of the Jewish People, Philadelphia, 1927.
MARETT, J. R. DE LA H., Race, Sex, and Environment, London, 1936.
MARMOL CARAVAIAL, LUYS DEL, Descripcion de Affrica, Granada, 1573.
MARTIN, C. P., Prehistoric Man in Ireland, London, 1935.
MARTIN, R., Lehrbuch der Anthropologie, 2nd ed., Jena, 1928. 3 vols.
MASPERO, G., The Struggle of the Nations, London, 1896.
MATIEGKA, J., Crania Bohemica, Prague, 1891.
MCGOVERN, WM. M., The Early Empires of Central Asia, Chapel Hill, North Carolina, 1939.
MEILLET, A., and COHEN, M., Les Langues du Monde, Paris, 1924.
MENDES-CORREA, A. A., Os Povos Primitivos da Lusitania, Oporto, 1924.

MENGHIN, O., Weltgeschichte der Steinzeit, Vienna, 1931.
MERKENSCHLAGER, F., Zur Volks- und Rassenkunde des Spreewaldes, Cottbus, 1933.
MEYER, H., Die Insel Teneriffe, Leipzig, 1896.
—, Uber die Urbewohner der Canarischen Inseln, in Adolf Bastians Festschrift.
MINNS, E. H., Scythians and Greeks, London, 1913.
MOLLISON, T., Some Human Remains Found in the North Kurgan at Anau, in Pumpelly, R., Explorations in Turkestan, vol. 2. (See Pumpelly.)
MONTANDON, G., La Race, Les Races. Paris, 1933.
—, L'Ethnie Française, Paris, 1935.
MOSCHEN, L., Crani Romani della Primera Epoca Cristiana, Torino, 1894.
MULLER, F., Allgemeine Ethnographie, 2nd ed., Vienna, 1879.
MUSIL, A., The Manners and Customs of the Ruwalla Bedawin. Oriental Explorations and Studies of the American Geographical Society, #6, New York, 1928.
MYRES, J. L., Who Were the Greeks? Berkeley, 1936.

NIEDERLE, L., Slovanské Starožitnosti, Prague, 1925.
NIKOLSKI, D. P., Bashkiri, St. Petersburg, 1899.
NORDENSTRENG, R., Origin, Growth, and Racial Components of the Swedish Nation, in Lundborg, H., and Linders, J. F. (see Lundborg).
—, Europas Männeskoraser, och Folkslag, 3rd ed., Stockholm, 1926.
NYESSEN, D. J. H., The Passing of the Frisians, The Hague, 1927.

OBERMAIER, H., Fossil Man in Spain, New Haven, 1924.
OESTERLEY, W. O. E., and ROBINSON, T. H., A History of Israel, Oxford, 1932.
OLORIZ Y AQUILERA, F., La Talla Humana en España, Madrid, 1896.
OUVAROV, A. S., Archaeologie de la Russie, Moscow, 1881.

PALLAS, PROFESSEUR, Voyages du Professeur Pallas, etc., Paris, 1772.
PAUDLER, F., Die hellfarbigen Rassen, etc., Heidelberg, 1924.
PENNIMAN, T. K., A Note on the Inhabitants of Kish Before the Great Flood, in Watelin, L. C., Excavations at Kish, Paris, 1934.
PITTARD, E., Les Peuples des Balkans, Geneva, 1920.
—, and REVERDIN, L., Étude de diverses series de cranes anciens de la vallée du Rhône (Valais), Neuchatel, 1899.
POLLERA, A., I Baria e I Cunama, Roma, 1913.
PRINCE, J. DYNELEY, Materials for a Sumerian lexicon, Leipzig, 1908.
PUCCIONI, N., Antropologia e Etnografia delle Genti della Somalia, Bologna, 1931. 2 vols.
—, Antropometria delle Gente della Cyrenaica, Florence, 1934.
PUMPELLY, R., Explorations in Turkestan, Washington, 1908.

RAINER, F. I., Enquêtes Anthropologiques dans trois Villages Roumains des Carpathes. TIAE, #1, Bucharest, 1937.

RANDALL-MACIVER, D., and WILKIN, A., Libyan Notes, London, 1901.
RASWAN, C., Black Tents of Arabia, Boston, 1935.
RECK, H., Oldoway, die Schlucht des Urmenschen, Leipzig, 1933.
RETZIUS, G., Crania Suecica Antiqua, Stockholm, 1900.
—, Finska Kranier, Stockholm, 1878.
—, and FÜRST, C. M., Anthropologia Suecica, Beiträge zur Anthropologie der Schweden, Stockholm, 1902.
RICHTER, B., Burkhards und Kaustoss. DRK, vol. 14, Jena, 1936.
RIED, H., Miesbacher Bevölkerung. DRK, vol. 3, Jena, 1930.
RIPLEY, W. Z., The Races of Europe, New York, 1899.
ROBERTS, C., Manual of Anthropometry, London, 1878.
ROCCA, P., Les Corses devant l'Anthropologie, Paris, 1913.
ROTH, C., A Short History of the Jewish People, London, 1936.
RUPPIN, A., The Jew in the Modern World, London, 1934.
RUTIMEYER, L., and HIS, W., Crania Helvetica, Basel and Geneva, 1864.

SALLER, K., Die Keuperfranken. DRK, vol. 2, Jena, 1930.
—, Die Fehmaraner. DRK, vol. 4, Jena, 1930.
—, Süderdithmarsische Geestbevolkerung. DRK, vol. 7, Jena, 1931.
SÁNCHEZ FERNANDEZ, L., El Hombre Español. AEPC, Congreso de Granada, June 20, 1911.
SCHACHERMEYER, FRITZ, Etruskische Frühgeschichte, Berlin, 1929.
SCHEIDT, WALTER, Die eiszeitlichen Schädelfunde aus der Grossen Ofnet-höhle und vom Kaufertsberg bei Nordlingen, Munich, 1923.
—, Die Rassen der jüngeren Steinzeit in N. W. Europa, Munich, 1924.
—, Alemanische Bauern. DRK, vol. 6, Jena, 1931.
—, and WRIEDE, H., Die Elbinsel Finkenwärder, Munich, 1927.
SCHLAGINHAUFEN, O., Die menschlichen Skeletreste aus der Steinzeit des Wauwilersees, Jena, 1925.
SCHLIEMANN, H., Ilios, City and Country of the Trojans. London, 1880; Leipzig, 1885.
SCHREINER, A., Die Nord Norweger. SNVO, no. 2, Oslo, 1929.
—, Anthropologische Lokaluntersuchungen in Norge; Valle, Hålandsdal, und Eidfjord. SNVO, #3, Oslo, 1929.
—, Anthropologische Lokaluntersuchungen in Norge; Hellemo (Tysfjordlappen). SNVO, #1, Oslo, 1932.
SCHREINER, K. E., Zur Osteologie der Lappen. SISK, Oslo, 1935.
SCHWERZ, Franz, Die Volkerschaften der Schweiz, Stuttgart, 1915.
SELIGMAN, C. G., and B. Z., Pagan Tribes of the Nilotic Sudan, London, 1932.
SELTZER, C. C., The Physical Anthropology of the Mediaeval Icelanders. MS. in Peabody Museum, Cambridge, Mass. (Unpublished.)
—, The Racial Characteristics of Syrians and Armenians. PMP, vol. 13, #3, 1936.
SERGI, G., Crani Preistorici della Sicilia, vol. 6, 1889.
—, Specie e varieta umane, Torino, 1900.
—, Crani Antichi della Sardegna, Rome, 1906.

—, Description of some skulls from the North Kurgan, Anau; in R. Pumpelly, Explorations in Turkestan, vol. 1, 1908.
—, Europa (L'origine dei popoli europei), Torino, 1908.
—, L'Uomo, Torino, 1911.
—, Crania Habessinica, Rome, 1912.
—, Le Origini Umane, Torino, 1913.
—, The Mediterranean Race, London, 1914.
SEWELL, R., and GUHA, B., Report on the Bones excavated at Nal. MASI, vol. 35, Calcutta, 1929, Appendix 5, p. 56.
SHAPIRO, H. L., The Heritage of the Bounty, New York, 1936.
—, Migration and Environment, New York, 1939.
SHETELIG, H., FALK, H., and GORDON, E., Scandinavian Archaeology, Oxford, 1937.
SIRELIUS, U. T., The Genealogy of the Finns, Helsinki, 1925.
SONNABEND, H., L'Espansione degli Slavi. CIPP, ser. 1, vol. 1, Rome, 1931.
SPEISER, E., Mesopotamian Origins, London, 1930.
STEIN, SIR AUREL, Serindia, Oxford, 1921.
STORRS, SIR RONALD, The Memoirs of Sir Ronald Storrs, New York, 1937.
STURLASON, SNORRE, Heimskringla, edited by E. Mousen, Cambridge, 1932.
SUK, V., Anthropological Notes on the Peoples of Carpathian Ruthenia, Brünn, 1932.

TALKO-HRYNCEWICZ, J., Przyczynek do Poznania. Swiata Kurhanowego Ukrainy, Krakow, 1899.
TAMAGNINI, E., Os Antiquos Habitantes das Canarias, CEAP, vol. 12, 1933.
TAPPEINER, F., Studien zur Anthropologie Tirols, Innsbruck, 1883.
THOMAS, BERTRAM, Arabia Felix, New York, 1932.
TWARJANOWITSCH, J. K., Materialien zur Anthropologie der Armenier (in Russian), St. Petersburg, 1897.

UJFALVY, K. E. VON, Aus dem westlichen Himalaja, Leipzig, 1884.
—, Les Aryens au Nord et au Sud de l'Hindou Kouch, Paris, 1896.

VALLOIS, H., Les Ossements Bretons de Kerné, Toul-Bras, et Port Bara. Vannes, 1935.
—, Notes sur les Têtes Osseuses, in Conteneau, G., and Ghirshman, A., Fouilles de Tépé Giyan. Musée du Louvre, Department des Antiquités Orientales, Serie Archéologique, vol. 3, Paris, 1935.
VAN DEN BERG, L. W. C., Le Hadhramout et les Colonies Arabes dans l'Archipel Indien, Batavia, 1886.
VAVILOV, N., Studies on the Origin of Cultivated Plants, Leningrad, 1926.
VERNEAU, R., Cinq Années de Séjour aux îles Canaries, Paris, 1891.
—, Appendix in Duchesne-Fournet, Mission en Ethiopie, Paris, 1909.
VISHNEVSKY, B. N., Antropologicheskiĭa Danniĭa o Naseleniĭ Permskaga Uezda, Perm, 1916.

WAEBER, O., Beiträge zur Anthropologie der Letten, Dorpat, 1879.
WALDHAUER, F., Zur Anthropologie der Liven, Dorpat, 1879.
WARNER, LANGDON, Report on Skeletons Excavated at Anau, in Pumpelly, R., Explorations in Turkestan, vol. 2 (see Pumpelly).
WEISSGERBER, H., Les Blancs d'Afrique, Paris, 1910.
WENIGER, J., Rassenkundliche Untersuchungen an Albanern. RPN, serie A, vol. 4, Vienna, 1934.
WETTSTEIN, E., Zur Anthropologie und Ethnographie des Kreises Dissentis, Zurich, 1902.
WHATMOUGH, J., The Foundations of Roman Italy, London, 1937.
WILLIAMS, G. D., Maya Spanish Crosses in Yucatan. PMP, vol. 13, #1, Cambridge, Mass., 1931.
WISCHNITZER, M., Die Juden in der Welt, Berlin, 1935.
WILMER, W. H., Atlas Fundus Oculi, New York, 1934.
WILSKMAN, I., Tilastollisia tietoja Suomen kansan ruumiilisesta "kehityksesta," III. Miesten kasvutilastoa. Helsinki, 1922.
WITT, H., Die Schädelform der Esten, Dorpat, 1879.

ZOLOTAREV, D. A., Etnicheskiĭ Sostav Naselenîa Sev.-Zap. Oblasti i Karel'skoĭ ASSR, TKIP, Vyp. 12, Leningrad, 1927.
—, Kol'skie Lopari, MKEI, Vyp. 9, Leningrad, 1928.
—, Kareli SSSR, MKEI, Vyp. 24, Leningrad, 1930.

INDEX OF AUTHORS

Abercromby, J., 463.
Adloff, Paul, 22.
Aguilo, Juan C., 149.
Aichel, Otto, 27, 28, 50, 52, 53, 54, 74, 123.
Alexandrova, A. I., 345, 349.
Amat, C., 475.
Andree, R., 374.
Andrews, T. H., 396.
Annandale, N., 336.
Anonymous, 588.
Anserov, N. I., 425.
Anton, M., 150.
Anuchin, D. N., 573.
Apostolidès, 605.
Appolinaris, 229.
Aranzadi, Telesforo de, 148, 149, 152, 493, 502.
Arbo, C. O. E., 166, 309, 313, 314, 316, 336.
Aristotle, 279.
Aruntinow, A., 630, 632.
Ashley-Montagu, M. F., 8, 243.
Asmus, R., 219, 562.
Atgier, E. A., 513.
Aubert, 513.
Augusta, K., 562.

Backman, G., 242, 362.
Baer, C. E., von, 200.
Bailly, René, 60.
Baranov, S. F., 579.
Baranowska-Malewska, Z., 565.
Bardenfleth, K. S., 332.
Barge, J. A. J., 531, 532.
Barnard, 209.
Baronas, I. O., 365.
Barons, S., 435.
Barras de Aragon, F. de las, 47, 100, 149, 152, 153, 206, 491, 492.
Barros e Cunha, J. G. de, 100, 495, 496.
Bartels, P., 156.
Bartucz, L., 155, 156, 229, 230, 232, 233, 234, 585, 586.
Baschmakoff, A., 224.
Basler, A., 164.
Bates, O., 98, 463, 464.
Batista i Roca, J. M., 149.
Battaglia, R., 148.
Baudoin, M., 191.
Baur, E., 5, 276.
Bayer, J., 105.
Baxter, D., 573.
Beddoe, J., 209, 374, 377, 385, 387, 389, 390, 392, 528, 532, 642.
Bedot, M., 549.
Bekri, el, 463.
Belloc, H., 284–85.
Bellows, H. A., 321.
Beloded, F. S., 569.
Benhazera, M., 471.
Bennett, 111.
Benoit, M. F., 472, 475, 480, 484, 643.
Bent, T. J., 448.
Benyon, E. D., 585.
Benzengre, B., 582.
Bercerot, J., 472.
Berthillon, 520, 528.
Bertholon, L., 98, 153, 463, 475, 476, 477.
Biasutti, R., 585, 587, 588, 614.
Bielskii, P. A., 614.
Birket-Smith, K., 48.
Black, D., 49.
Bloch, A., 147.
Bloxam, G. W., 386, 388, 390.
Blumenbach, 280.
Boas, F., 556, 646.
Bochenek, A., 566.
Böe, J., 69.
Bogdanov, A. P., 103, 125.
Bolk, L., 532.
Bonch-Osmolovskii, G., 69.
Bonin, G. von, 30, 31, 34, 48, 117.
Borrow, G., 505.
Bosch-Gimpera, P., 150.
Bouchereau, A., 457, 513, 516.
Bouchet, Dr., 171.
Boule, M., 40, 43, 44, 45, 52, 54, 60, 62, 65, 67, 99.
Boureau, R., 138.
Bowles, G. T., 9, 201, 416, 419, 420, 431.
Bradbrooke, W., 386.
Brash, J. C., 209.
Breig, A., 543.
Bremer, W., 192.
Brennsohn, I., 365.
Breuil, Abbé, 75.
Brezina, E., 551.
Brion, M., 233.

Broca, P., 169, 515.
Brooks, C. E. P., 10.
Browne, C. R., 195, 377.
Browne, Brig.-Gen. J. G., 630.
Bruni, E., 147.
Brunton, G., 93.
Bryce, T. H., 111, 211.
Bryk, J., 566, 567.
Bryn, H., 9, 275, 301, 302, 304, 309, 310, 312, 317, 319, 330, 477.
Bukeĭkhan, A. N., 579.
Bunak, V. V., 201, 234, 339, 346, 573, 575, 617, 625.
Burrau, C., 332, 334, 335.
Buxton, L. H., 88, 138, 625.

Callander, J. G., 160.
Calori, C. L., 555.
Cameron, J., 148.
Capus, G., 590.
Cardoza, F., 495, 497.
Carlier, G., 513, 517.
Carret, J., 513.
Carriere, G., 513, 517.
Castro, L. de, 448, 450.
Cervinka, J. L., 219.
Chadwick, Nora K., 179.
Chantre, E., 98, 169, 418, 421, 425, 457, 459, 476, 477, 625, 630, 632, 641.
Chassagne, A., 513.
Childe, V. G., 16, 78, 79, 92, 93, 107, 113, 115, 125, 141, 148, 150, 155, 160, 162, 165, 286.
Chomiakov, M. N., 347, 348.
Chubinski, P. P., 569.
Cipriani, L., 408, 448.
Claerhout, J., 528.
Clarke, J. G. D., 49, 56, 67, 69, 73, 74, 123.
Cline, W. B., 468.
Cohen, M., 445.
Cole, Fay-Cooper, 40, 59.
Collignon, R., 10, 153, 502, 503, 513, 515, 516, 518, 519, 522.
Comas, J., 148.
Conitzer, H., 274.
Coon, C. S., 41, 463, 495, 597, 600.
Cooper, J., 387.
Coutil, L., 167.
Craig, J., 459.
Craw, J. H., 160.
Cripps, L., 390.
Crowfoot, J. W., 619, 621.
Čučukala, G. J., 605.
Cunningham, I. J., 273.
Cvijić, J., 588.
Cwirko-Godyki, M., 587.
Czarnowski, S. J., 103.
Czekanowski, J., 249, 286, 288–89, 306, 560, 564, 567.
Czortkower, S., 168.

Danilov, N. P., 418.
Davenport, C. B., 377, 385, 556, 565, 642.
Davies, E., 386.
Davis, J. B., 194.
Debetz, G., 126, 168, 169, 171, 200, 219, 224, 225, 231, 234, 238.
Debierre, C., 513, 517.
Dechelette, J., 115.
Deckert, E., 642.
De Geer, S., 254.
Demianowski, A., 571.
Deniker, J., 280, 281.
DePauw, L., 526.
Derry, Douglas, 94.
Dershinsky, J. E., 566.
Derviz, D., 219, 573.
Deslaers, M. H., 150.
Diebold, V., 571.
Dingwall, D., 210.
Dirr, A., 632.
Dixon, R. B., 420, 421.
Djavakhov, A., 632.
Djawachischwili, A., 425, 630, 632.
Doniči, A., 106, 199, 200, 614.
Dos Santos, J. R. Jr., 495, 497.
Dow, D. R., 160.
Downes, R. M., 390.
Drontschilow, K., 155, 610.
Dubnow, S., 435.
DuBois, E., 264.
Dubowski, W., 642.
Duckworth, W. L. H., 141, 209, 264, 498, 500, 501.
Duncan, J. W., 387.
Dunlop, A., 386.
Dupertuis, C. W., 376.
Durand de Gros, J. P., 513, 516.
Dus, F., 126.
Duveyrier, H., 471.
Dzhavakhov, A. N., 641.

Ecker, A., 211.
Edwards, A. J. H., 111, 160.
Ehrich, R. W., 88, 101, 105, 411, 421, 422, 562.
Eichholz, E. R., 568.
Eickstedt, E. von, 249, 286–88, 289, 386, 391, 396, 397, 398, 635.
Elderton, E. M., 390.
Eliseev, A. V. (Elisiev, A.), 358, 619.

El'kind, A., 434.
Elliot-Smith, Sir G., 23.
Engberg, R. M., 138.
Erckert, R. von, 425, 625, 632.
Erikson, E., 632.
Evans, Sir Arthur, 141.

Falk, H., 202.
Fallot, A., 499.
Fawcett, E., 112.
Fewkes, V. J., 69, 101, 105.
Field, Henry, 47, 68, 86, 410, 411, 412, 413, 418.
Fischer, E., 5, 244, 264, 276, 487, 539.
Fishberg, M., 443, 642, 643.
Fisher, R. A., 248.
Fleming, R. M., 386.
Fleure, H. J., 385, 386, 389, 390, 396.
Fleury-Cuello, E., 212.
Fligier, C., 642.
Flower, W. H., 386.
Folmer, H. C., 531.
Forbes, A., 387.
Fouché, L., 25.
Fournel, H., 463.
Fox, A. L., 386, 390.
Frankfort, H., 89, 90.
Frankowska, M. z R., 565.
Frasetto, F., 448, 558.
Freire-Marecco, B., 386.
Friedenthal, A., 32, 167.
Frizzi, E., 538, 553.
Fürst, Carl M., 73, 101, 123, 138, 144, 145, 156, 326.

Galloway, A., 25.
Galton, E., 388.
Gardiner, J. B., 387.
Gardner, B., 605.
Garnier, M., 513.
Garrod, D. A. E., 33, 40, 44, 61, 75.
Garson, J. G., 110, 111, 386, 388, 390, 448.
Gáspár, J., 233.
Gaster, M., 504.
Gaul, J., ix.
Gautier, E. F., 463.
Genna, G. E., 147.
Geyer, E., 163, 213, 301, 302, 303.
Gieseler, W., 44, 45.
Gil'chenko, N. V., 632.
Gini, C., 556.
Giuffrida-Ruggeri, V., 147.
Gjessing, R., 301, 302, 305.
Gladstone, R. J., 264, 392.
Glodt, H. R., 273.
Glubb, Maj., 411.
Glück, L., 504.
Gobineau, A. de, 285.
Gochkevitch, 169.
Goldman, H., 101, 105.
Göllner, H., 546.
Golomshtok, E., 170.
Gordon, E. V., 202.
Gordon, J. T., 160.
Goring, C., 386, 391, 393, 394.
Goroshchenko, K., 169.
Götze, A., 184.
Götze, Walther, 109.
Gould, B. A., 377, 385.
Grau, R., 545.
Gray, J., 387, 395.
Greenlee, R. F., 69.
Greenwell, W., 192.
Greenwood, R., 390.
Gregor, W., 387.
Greguss, P., 231.
Griffiths, G. B., 392.
Grillière, 513, 517.
Gromov, V. I., 235.
Grube, O., 353.
Grünbaum, O. F. F., 386.
Gsell, S., 463.
Guha, B., 87, 420.
Günther, H., 289.
Guthe, C., 642.

Haberlandt, A., 591, 597.
Haddon, A. C., 112, 161, 377, 386.
Haeckel, E. H., 280.
Halka, S., 565.
Hamy, E. T., 191, 214.
Hannesson, G., 323, 324, 325, 332, 334.
Hansen, A. M., 332.
Hansen, Fr. C. C., 10.
Hansen, S., 332, 334, 336.
Hasluck, M. M., 605, 610, 616, 622.
Hatt, G., 305.
Hauschild, M. W., 207.
Hausman, L. A., 274.
Hawes, C. H., 141, 500, 517, 608.
Hawes, H. B., 141.
Heberer, G., 109, 164.
Heiberg, P., 332.
Heinzel, R., 324.
Héléna, Ph., 149.
Héléna, Th., 149.
Hell, M., 213.
Hellich, B., 164, 189, 212, 560.
Henckel, K. O., 138, 211.
d'Hercourt, G., 476, 478, 500.
Hermann, A., 537.

Hermann, O., 585.
Herodotus, 196, 198, 339, 463, 464.
Hervé, G., 100, 513.
Hesch, M., 360, 362, 365, 568.
Hilaire, G. de St., 280.
Hildén, K., 354, 357.
Hillebrand, J., 155, 166.
Himmel, H., 571, 614, 643.
Hippocrates, 198, 279.
Hisinger-Jägerskiöld, E., 304.
Hoadley, M. F., 372.
Hochstetter, F. von, 182.
Höfler, M., 538.
Hölder, H., 211.
Holl, M., 538.
Holter, F., 212.
Hooke, B. G. E., 113, 375, 376.
Hooton, E. A., 5, 29, 41, 42, 209, 249, 287, 321, 325, 376–77, 385, 393, 463, 485, 486, 487, 556, 557.
Hopwood, A. T., 18, 33.
Horvath, A., 185.
Houssay, M., 418.
Houzé, E., 215, 526, 527, 528, 529.
Hovelacque, A., 513.
Howells, W. W., 377.
Hoyos Sainz, L., 100, 491, 492.
Hrdlička, A., 28, 377, 460, 461, 556, 565, 573, 585, 588, 605, 643.
Hubert, H., 186, 188, 203, 372.
Huck, M., 539.
Hughes, B. O., 430, 625, 629.
Hulse, F. S., 493.
Humphreys, R., 209.
Hüs, 211.
Huszár, G., 220.
Huxley, H. M., 439.
Huxley, T. H., 111, 280.

Iarkho, A. I. (Iarcho), 422, 425, 579, 633.
Ivanovsky, A. L., 200, 349, 574.
Izzeddin, N., 410, 623.

Jacob, G., 188.
Jacobs, J., 643.
Jacques, V., 150, 526.
James, T. C., 396.
Janko, J., 585.
Jankowsky, W., 156, 274.
Jantschuk, N. A., 365.
Jaubert, L. J., 499.
Jelinek, B., 219.
Jendyk, R., 200.
Jerums, N., 362.
Jochelsen, W., 306, 337, 348, 577, 631, 634.
Jordan, J., 88.
Jordanes, 229.
Joyce, T. A., 414, 420, 448.
Junge, J., 196.

Kajava, Y., 301, 302, 304, 338, 357.
Kansu, S. A., 619, 622.
Kappers, C. U. A., 418, 421, 422, 623, 630.
Karpeles, B., 504.
Karvonen, J. J., 357.
Kastein, J., 435.
Kazantsev, A. I., 235.
Keiter, F., 12, 537, 540, 552.
Keith, Sir Arthur, 21, 26, 33, 48, 49, 53, 62, 87, 110, 111, 171, 428.
Kendrick, T., 208.
Khaldun, Ibn, 463.
Khanikoff, N., 418.
Kharusin, A. N., 583.
Khonuakov, 347.
Kidder, H. H., 477, 478.
Kimball, S., 605.
Kirkoff, N., 610.
Klenke, W., 540, 546.
Klimek, S., 236, 307, 448.
Klinke, K., 274.
Knöbl, G., 552.
Knorre, G. von, 354, 362.
Koettlitz, R., 448.
Kollman, J., 114, 211.
Kolmogorov, A. J., 358.
Konstantinovic, B., 589.
Kopernicki, I., 218, 504, 571, 643.
Koppers, W., 179.
Korolev, S. R., 583.
Korosi, M., 587.
Kossinna, G., 54, 55, 73, 74, 123, 180, 286.
Kossovitch, N., 443, 480, 484, 643.
Koumaris, J., 144, 145, 605.
Krasnov, A., 569.
Krauss, F. S., 590.
Krecsmarik, E., 230.
Krischner, H., 442.
Krischner, Mrs. H., 442.
Krogman, W. M., 50, 136, 428.
Kurdov, K., 632.

Lagneau, G., 513.
Lagotala, H., 189.
Laing, S., 111.
Lammens, H., 623.
Langdon, S., 88.
Lansel, Peider, 548.
Lapouge, G. V. de, 149, 513.

Larsen, C. F., 205, 309, 313.
Laufer, B., 305.
Lawrence, Col. T. E., 410.
Layard, D., 209.
Leakey, L. S. B., 22, 37, 40, 44, 45, 57, 92.
Leblanc, E., 472.
Lebzelter, V., 105, 106, 185, 189, 214, 230, 231, 232, 504, 552, 562, 589, 591, 597, 609, 610, 614, 622.
Lehmann, O., 534.
Lehmann-Nitsche, R. 211.
Lempertowna, G., 643.
Lencewicz, Stanislaw, 109.
Lenz, E., 5, 276.
Leo Africanus, 463.
le Pontois, Bernard, 166.
Lester, P., 448.
Levit'kyj, I , 103.
Leys, N. M., 408, 414, 448.
Linders, F., 287, 326, 329, 330, 331.
Lipiec, M., 643.
Livi, R., 500, 555.
Lorimer, D. L., 175.
Love, A. G., 385, 556, 565, 642.
Low, A., 111, 160, 161.
Lowman, G. S., 179.
Lundborg, H., 287, 326, 329, 330, 331.
Luschan, E. von, 141, 385, 388.
Luschan, F. von, 189, 285, 289, 380, 385, 388, 608, 619, 621.
Luther, M., 302, 357, 358.

MacAuliffe, L., 491, 504, 513, 517, 519, 528.
MacCurdy, G. G., 125.
MacDonnell, W. R., 375, 390.
Maciesza, A., 565.
Mackenprang, E., 332.
Macleay, K. S., 387.
Mahoudeau, P. G., 499.
Mainov, V. N., 345.
Majer, J., 571, 643.
Majewski, E., 200, 218.
Makarenko, Nicholas, 103.
Maleš, B., 589, 591.
Maliev, N., 346, 347, 348, 349, 350, 351, 578.
Malinin, K., 632.
Maly, J., 212, 560.
Manouvrier, L., 214, 513.
Mantegazza, P., 153.
Marett, J. R. de La H., 6, 50, 305.
Marett, R. R., 110.
Margolis, M., 435.
Marie, A., 504, 517, 519, 528.
Marmol Caravaial, Luis del, 463, 465.
Marshall, J., 390.
Martin, C. P., 112, 161, 191, 211, 377.
Martin, R., 12, 15, 241, 243, 244, 649.
Maspero, G., 464.
Matiegka, J., 164, 183, 219, 560, 562, 646.
Mattei, A., 499.
Mayet, L., 516.
McCown, T. D., 26, 53, 61, 62.
McGovern, W. M., 196, 227.
McGregor, J. H., 53.
Meillet, A., 445.
Mendes-Correa, A. A., 100, 495.
Menghin, O., 40, 93, 115, 286.
Merkenschlager, F., 562.
Merlin, H., 213.
Meyer, A. B., 165.
Meyer, H., 285.
Michelsson, G., 353.
Mies, J., 264.
Minns, E. H., 196.
Mochi, A., 147, 408, 409.
Modrezewski, L. T., 567.
Mollison, T., 44, 45, 66, 102.
Montandon, G., 34, 286, 287, 502, 503, 548.
Moore, A. W., 386.
Morant, G. M., 15, 20, 28, 30, 32, 33, 91, 94, 95, 96, 100, 113, 158, 160, 191, 192, 207, 209, 248, 372, 376, 503, 610, 616, 622, 646.
Mortimer, J. R., 191, 209.
Moschen, L., 194.
Movius, H. L., Jr., 112, 161, 171.
Muffang, M. H., 386.
Mühlmann, W. E., 538, 539.
Muller, E., 605.
Müller, F., 280.
Müller, G., 213.
Müller, W., 219.
Mulligan, J. H., 387, 390.
Murray, G. W., 457.
Musil, A., 410.
Mydlarski, J., 306, 564, 565, 567.
Myers, C. S., 459.
Myres, J. L., 141, 143, 145.

Nalimov, 349.
Nassonoff, N. W., 421.
Nazarov, P. S., 578.
Nefedov, J. W., 582.
Nehring, A., 178, 180, 222, 238.
Neophytos, A. G., 605.
Nestor, I., 106.
Neuville, R., 138.
Newbold, E. M., 390.
Niceforo, A., 500.

Nickul, K., 357.
Nicolaeff, Lon, 574.
Nicolucci, G., 555.
Niederle, Lubor, 212, 216, 218, 560.
Nielsen, H. A., 167, 203.
Nikolski, D. P., 578.
Nikolsky, B., 346.
Nordenstreng, R., 287, 327, 328.
Nosov, A. Z., 569, 583, 610.
Nurk, L., 349.
Nyessen, D. J. H., 531.

Obermaier, H., 40, 47, 63.
Oesterley, W. O. E., 432, 435.
Olechnowicz, W., 365, 565.
Oloriz y Aquilera, F., 491, 498, 502.
Ornstein, 605.
Ortmann, R., 188.
Oshanin, L. V., 579.
Ouvarov, A. S., 126.

Palliardi, J., 156.
Pantuchov, J., 632, 643.
Papilian, V., 614.
Papillault, G. F., 476, 477, 513, 517.
Parr, L. W., 623.
Parsons, F. G., 373, 374, 385, 386, 387, 392, 393, 539.
Paudler, F., 285.
Pavlov, A., 47, 126.
Peake, H., 210.
Pearson, K., 158, 248, 386.
Peate, I. C., 390, 396.
Penniman, T. K., 88.
Péquart, Marthe, 65.
Péquart, Saint-Juste, 65.
Perez de Barrados, J., 206.
Petersen, E., 619.
Pexiederova, M. R., 560.
Pfeiffer, R. E., 432.
Piette, E., 66.
Piroutet, M., 165, 171.
Pittard, E., 86, 114, 165, 504, 538, 589, 591, 597, 605, 609, 610, 612, 614, 622, 643.
Pitt-Rivers, A. H. L., 386, 388, 390.
Ploy, H., 552.
Pöch, H., 189, 569.
Pollera, A., 457.
Pommerol, F., 513.
Poschen, P., 583.
Prelov, E. I., 345.
Priebsch, R., 524.
Priman, J., 354.
Prince, J. D., 175.
Priscus, 229, 233.
Pröbstl, L., 194, 195.
Procopius, 463.
Pruner-Bey, F., 289.
Puccioni, N., 448, 468.

Quatrefages, de, 280.

Radlauer, C., 448.
Rainer, F. I., 614.
Ramstedt, G. J., 223, 306.
Randall-MacIver, D., 476, 477, 478.
Ranke, J., 538.
Raswan, C., 410.
Rau, P., 169.
Raymond, P., 190.
Reche, O., 73, 74, 105, 107, 207, 529, 531, 532.
Reck, H., 44.
Rehak, J., 562.
Reicher, M., 538.
Reid, R. W., 387, 390.
Reisner, G. A., 98.
Retzius, G., 54, 123, 166, 204, 327, 355, 358.
Reuss, K., 219.
Reverdin, L., 538.
Ribbing, L., 325, 332, 335.
Rice, D. T., 88.
Richter, B., 542.
Ried, H. A., 211, 538, 543.
Ripley, W. Z., 10, 284–85, 518.
Ritchie, J., 160.
Roberts, C., 391.
Robinson, T. H., 432, 435.
Rocca, P., 499.
Rochet, C., 194.
Rodjestvensky, A. N., 568.
Roguinski, A., 231, 579.
Rosensprung, L. M., 182.
Rosinski, B., 7, 109, 141, 565, 608.
Roth, C., 435.
Routil, R., 513, 521.
Rudenko, S. I. (Roudenko), 307, 350.
Ruhlman, A., 150.
Ruhnau, K., 533.
Ruppin, A., 435.
Rutimeyer, L., 211, 538.
Rutkowski, L., 218, 565, 643.
Ryland, 209.

Saller, K., 103, 126, 156, 211, 244, 265, 533, 540, 542, 643.
Sallust, 463, 464.
Salmon, P., 116, 117.
Samson, O., 646.
Sanchez Fernandez, L., 492.

Sant'Anna Marques, S. de, 495.
Santelli, 457.
Sapir, E., 180.
Sasse, A., 531.
Sasse, J., 532, 533.
Sawtelle, R. (Mrs. Wallis), 66, 116.
Schachermeyer, F., 155.
Scheiber, S. H., 585.
Scheidt, W., 11, 66, 99, 330, 395, 540, 543.
Schenk, A., 114, 115, 165.
Schicker, J., 211.
Schiff, F., 605, 608.
Schlaginhaufen, O., 114, 115, 165, 184, 189, 450, 548, 549, 550.
Schliemann, H., 137.
Schliz, A., 156, 182, 183, 188, 189, 206.
Schmidt, E., 555.
Schneider, L , 562.
Schreiner, A., 8, 309, 315, 316, 317, 321, 325.
Schreiner, K. E., 33, 205, 300, 301, 302, 304, 305, 307, 309, 313, 321.
Schück, A., 616.
Schugaiew, W. S., 219.
Schumacher, O., 145.
Schumann, H., 219.
Schürer von Waldheim, Hella, 106, 164, 182.
Schuster, E., 390.
Schwerz, F., 212, 550, 555.
Schwidersky, N., 632.
Schwidetsky, I., 249, 564.
Sedlaczek-Komorowski, L., 156, 168.
Seeland, N., 574.
Seligman, C. G., 408, 457.
Seltzer, C. C., 10, 326, 623, 625.
Seraczin, A., 213.
Sergeev, V. I., 346.
Sergent, E., 614.
Sergi, G., 101, 102, 104, 141, 147, 155, 194, 283–84.
Sergi, S., 448.
Serra i Vilaro, 152.
Sevastianov, 349.
Şevket Aziz Kansu (Shevket, Chevket, see Kansu).
Sewell, R., 87.
Shanklin, W. M., 410, 623.
Shapiro, H. L., 5, 8, 38, 48, 538.
Shea, S., 112, 161.
Shetelig, H. F. & G., 166, 202.
Shipton, G. M., 138.
Shrubsall, F. C., 386.
Shugaiev, U. S., 573.
Sidonus, 229.
Sirelius, U. T., 337.
Škerlj, B., 587.
Smirnov, M., 169.
Smith, J., 387.
Smith, W., 386.
Snigirev, V. S., 573.
Sobolski, K., 568.
Sommier, S., 236, 307, 350, 578, 632.
Sonnabend, H., 216.
Speiser, E., 90, 175.
Ssilinitsch, J. P., 234.
Steensby, H. P., 332.
Stefko, V. H., 219, 573.
Steggerda, M., 532.
Stein, Sir A., 420, 431.
Stephanos, C., 605.
Stocký, A., 107, 164.
Stoessiger, B. N., 374.
Stojanowski, K., 168.
Stołyhwo, K., 201.
Storrs, Sir R., 625.
Strauch, K., 109.
Stshukin, J., 632.
Sturlason, S., 321, 322.
Suk, V., 562, 571.
Szinnyei, 223.
Sziráky, S., 220.
Szombathy, J., 163, 219, 560.
Szpidbaum, H., 443.

Tagliaferro, N., 147.
Talko-Hryncewicz, J., 47, 200, 365, 367, 564, 565, 566, 568, 569, 571, 582, 583, 585, 642, 643.
Tallgren, A. M., 169, 224.
Tamagnini, E., 485, 492, 495, 496.
Tappeiner, F., 538, 552.
Taylor, J. J., 386.
Tebebinskaïa-Schenger, N., 583.
Teit, J. A., 387, 393.
Teploukhov, S. A., 347.
Thalmann, G., 214.
Themido, A. A., 495, 496.
Thomas, B., 403, 427–28.
Thompson, C. M., 390.
Thooris, A., 517.
Thurman, J., 111, 158, 194.
Tildesley, M. L., 241, 597.
Tippett, L. H. C., 386.
Titiev, M., 605.
Tkač, M., 569.
Tocher, J. F., 387, 391, 392, 395.
Toldt, C., 219, 538, 552, 553.
Topinard, P., 280, 332, 475, 513, 519, 520.
Tormo, I. Ballester, 148.
Tratman, E. K., 112.
Trauwitz-Hellwig, J. von, 156.

Tur, Jan, 168.
Turner, Sir W., 75, 376.
Twarjanowitsch, J. K., 625.

Uhlenbeck, C. C., 178.
Ujfalvy, K. E. von, 420, 634.
Ul', E. F., 345, 349.
Uria y Riu, J., 491.

Vallois, Henri V., 40, 43, 44, 45, 54, 55, 60, 61, 64, 65, 67, 87, 99, 149, 191.
Valšik, J., 591.
Van den Berg, L. W. C., 402.
Van den Broek, A. J. P., 530, 532.
Vanderkindere, L., 528.
Van Overloop, M., 530.
Vaufrey, R., 40, 47, 59.
Vavilov, N., 444.
Venn, J., 390.
Verneau, R., 33, 40, 54, 99, 285, 448, 450, 472, 485.
Vervaeck, L., 526, 527.
Vildes, J., 352, 353.
Virchow, R., 106, 109, 124, 126, 155, 167, 169, 189, 212, 219, 354.
Viré, A., 476.
Vishnevsky, B. N., 102, 235, 349, 577, 635, 636, 639.
Vishogrod, J., 632.
Vitols, T. M., 362.
Volkov, Th., 571.
Vorobiev, V., 583, 632.
Vram, Ugo, 213, 591.

Wacker, R., 538, 554.
Waeber, O., 362.
Wagenseil, F., 443, 619.
Wainwright, G., 181.
Waldhauer, F., 352, 353.
Walk, C. S., 386.
Wallis, Mrs. R. S., 190, 211, 214.
Wankel, H., 219.
Warner, Langdon, 102.
Wastl, J., 551.
Wateff, S., 610.
Waterston, D., 161.
Weidenreich, F., 554.
Weisbach, A., 182, 184, 264, 551, 552, 562, 571, 587, 588, 590, 591, 605, 609.
Weissenberg, S., 439, 442, 443, 578, 625, 639, 641, 642, 643.
Weissgerber, H., 477.
Weninger, J., 597.
Weslawawa, Eleanora, 109.
Westergaard, H., 332.
Westerlund, F. W., 355, 357, 358.
Wettstein, E., 538.
Whatmough, J., 180, 182, 193, 194, 195.
White, Miss J. M., 112.
Wiazemsky, Prince, 589.
Wichman, Y., 337.
Wiklund, K. B., 299, 300.
Wilkin, A., 476, 477, 478.
Willer, O., 582.
Williams, G. D., 492.
Willoughby, R. R., 556, 562.
Wilmer, W. H., 276.
Wilskman, I., 357.
Windle, B. C. A., 386.
Wischnitzer, M., 435.
Witt, H., 354.
Wölfel, J., 487.
Wolfson, H., 432, 435, 638.
Woodbury, George, 11.
Worobjew, B. W., 574.
Wriede, H., 540.
Wright, W., 191.
Wrzosek, A. (Worozek), 565, 589.
Wrzoskowa, M., 565.

Young, M., 209, 210, 375.
Young, W. J., 273.

Zaborowski, S., 103, 145, 147, 231, 234.
Zakrzewski, A., 564.
Zampa, R., 193, 591.
Zbinden, F., 550.
Zdroevski, A., 568.
Zejmo-Zejmis, S., 565.
Zeland, N. L., 573, 574.
Zeltner, F., 472.
Zimmerman, G., 106.
Zograf, N. J., 307, 574, 578.
Zolotarev, D. A., 301, 302, 337, 343, 344, 345.
Zuckerkandl, E., 182, 538.
Zupanic, N., 155, 619.

SUBJECT INDEX

Abydos, cranial material, 91, 100.
Abyssinia, Neolithic, 78. *See also* Ethiopia.
Abyssinians: *see* Ethiopians.
Acheulean culture, skull *ill.*, 52, *fig.* 4.
Adlersburg crania, compared with Food Vessel, 161.
Aegean Islands, as source of Neolithic, 101; Bronze Age, 132–33, *chart.*
Aenolithic: *see* Copper Age.
Afalou crania, described, **40–44**; #28, described, 40, compared with Gamble's Cave, 44, 45, compared with Asselar man, 60, relation to Mediterranean race, 83; #12 *ill.*, 54, *fig.* 10; compared with Asselar man, 60, with Erg el Ahmar, 62, with Ofnet, 68, with Scandinavian Neolithic brachycephals, 124; relation to Tasian, 93, to Algerians, 99; as origin of Alpine brachycephals, 119; as large brachycephals, 265; survival in Europe, 291, in N. Africa, 467, among Arabo-Berbers, 470, among Riffians, 483, in Canary Islands, 488.
Afar: *see* Danakil.
Afghanian, Neolithic, defined, 85; Luristan skulls, 87; areas occupied by, in Dark Ages, 176–77, *chart.* *See also* Irano-Afghans.
Afghanistan, climate in Neolithic, 78; Aryans in, 180; invasion by Huns, 228; Iranians in, 238; dolichocephaly in, 256; racial study of, **417–18.**
Afghans, in Iran, 417; racial characteristics, **419–20**; *ill.*, Plate 18, *fig.* 5.
Africa, Aurignacian man in East, **44–46**; Upper Palaeolithic hunters of N., 39–44; Mesolithic man in, **57–61**; Neolithic N., **98–99**; as origin of French Neolithic, 115; Bell Beaker and N., 157; E., stature in, 255; N., weight, 255; dolichocephaly in, 256–57; N., head size in, 265; N., pigmentation, 272; Deniker's classification in, 281; Jews in, 437, 438; Mediterranean races, 444–58, 462–89, *ill.*, Plate 21, *figs.* 1–6; N., Gypsies in, 504.
African Bushmen: *see* Bushmen.
Afridis, identified, 417; face measurement, 419; *ill.*, Plate 18, *fig.* 7.
Agau, identified, 438; classified, 446; racial characteristics, **449**; *ill.*, Plate 20, *fig.* 2.
Aginocastrians, racial characteristics, **602–03.**
Ahrensburg culture, origin, 70; placed, 71; and Maglemose, 72.
Aïn Jebrul crania, placed, 138.
Ainu, hair, 278; in Deniker's system, 282.
Aissores: *see* Assyrians.
Akeydat, identified, 623.
Alans, placed, 196; and Goths, 197; cranial type, 200; under Turks and Mongols, 229.
Alawiya, racial characteristics, 261, **623.**
Albania, Illyrians in, 185; Slavic invasion, 217; language distribution, 561, *map;* Serbs in, 589; tribal divisions in N., 596, *map;* Vlachs in, 614; Osmanli Turks in, 617.
Albanians, teeth modifications among, 29; speech origin, 179; nasal characteristics, 279; in Crimea, 582; in Yugoslavia, 587; racial study of, **595–604**; in Greece, 604; compared with Armenians, 627; *ill.*, Plate 8, *figs.* 4–6; Plate 14, *figs.* 3, 4; Plate 39, *figs.* 2–5; Plate 30, *fig.* 3.
Alemanni, origin, 206; described, 212; Keltic mixture with, 215; distribution, 537; relation to Genkingen Germans, 544.
Alexandropol crania, described, 200.
Algeria, skeletons described, 99; races described, **474–79.**
Alishar, in Palestine, 138; compared with Minoans, 141, with Etruscans, 154.
Alishar Hüyük crania, described, 136.
Almeria, Los Millares culture, 148.
Alouites: *see* Alawiya.
Alpine race, discussed, **113–20,** 129; compared with Borreby, 124, with Bronze Age Cypriotes, 139–40, with Kumans, 234; areas occupied by, in Iron Age, 176–77, *chart;* head size, 266; hairiness, 278; in Deniker's system, 283; in Ripley's classification, 284, 285; in von Eickstedt's system, 287; in Czekanowski's system, 288, 289; classified, 289, 290; survivors in Europe, 291; and

Lapps, 300; and W. Norwegians, 319; and Mediterraneans, 400; and Canary Islands, 486, 487; in central Europe, introduction, 510–11; in France, **511–22**; in Belgium, 529; in Germany, 535, 538–39, 543, 544, 545, 546, 547; in Switzerland, 549, 550, 553; in Austria, 551; in Italy, **554–59**; and Czechs, **560–62**; in Poland, 563, 566, 567; and Ruthenians, 572; and Magyars, 585, 586; and Montenegrins, 594; and Albanians, 601; and Dinarics, 601, 602; and Toscs, 603; and Greeks, 606–07; and Vlachs, 615, 616; and Osmanli Turks, 619, 621, 622; and Armenoids, 629; and Ossetes, 632; and Caucasic-speakers, 633, 634; and Tajiks, 637, 638; and Turkestan Jews, 641; and Caucasus Jews, 641; and Ashkenazim Jews, 645; geographical extent of, 646–47; result of blend with Mediterraneans, 647; in Germany, *ill.*, Plate 11, *figs.* 1–4; W. and central Europe, *ill.*, Plate 12, *figs.* 1–4; aberrant forms, W. and central Europe, *ill.*, Plate 13, *figs.* 1–4; central, E., S. E. Europe, *ill.*, Plate 14, *figs.* 1–5; Asiatic, *ill.*, Plate 15, *figs.* 1–6; Nordic blends, *ill.*, Plate 34, *figs.* 1–4.

Alps, glaciation and, 19.

Altaic speech, languages based on, 236; conclusions discussed, **236–40**; European distribution, 338, *map;* Scyths and, 196; surplanting Iranian, 197–98; speakers, 223; in Caucasus, distribution, 631, *map.*

Altenburg crania, described, 109.

al 'Ubaid crania, described, **86, 87, 88**; compared with Long Barrow, 112, with Corded, 104.

Amber, as medium of exchange, 134, 166; Bell Beaker search for, 155.

America, Gypsies in, 506, 507; Italians in, 556–57; Toscs in, 603; Greeks in, 606–07; Armenians in, 625; Jews in, 643–44; New Englander, *ill.*, Plate 25, *fig.* 2; Plate 27, *fig.* 4; Jews, *ill.*, Plate 45, *figs.* 3, 4, Plate 46, *figs.* 1–5.

American Indian, derivation of, 2; resemblance to Upper Palaeolithic man, 32; linked with Eskimo, 48; language compared with Japhetic, 175; pigmentation, 277; in Deniker's system, 281; hybrid origin, 602.

Amharas, distribution, 447; racial characteristics, **449–57**.

Ammonites, identified, 434.

Amorites, described, **432–34**; *ill.*, 433, *fig.* 36.

Anan'ino culture, described, **224–25**.

Anatolia, Neolithic movement from, 82; Neolithic sites, 86; as source of Neolithic, 101, 102; Bronze Age in, **136–37**; as iron center, 181; Turks in, racial characteristics, **618–20**.

Anatolians, movements traced, 80–81, *map* 2.

Anau crania, described, 102–103; compared with Maruipol remains, 103; painted pottery, 105; compared with Alishar, 136.

Andalusians, described, 491; racial characteristics, **493–94**.

Andronovo: *see* Minussinsk.

Anghelu Ruju crania, described, 147.

Angles, origin, 333; in British Isles, 372.

Anglo-Saxons, origin, 206; skulls compared with Hannover, 207; described, **208–11**; skulls compared with Thuringians, 212; relation to Frankish skulls, 214; compared to Polish Slavs, 218; classified, 293.

Animal husbandry: *see* Domestic animals.

Anjera, distribution, 480.

Arabia, dolichocephaly in, 256–57; racial study of Mediterranean race in, **401–11**.

Arabic, as source of information on race, 174, 218; distribution in E. Africa, 446, *map;* in N. Africa, 467.

Arabs, racial characteristics, 266, 278; racial classification by, 279; in Deniker's system, 281, 282; as rulers of ancient Jews, 435; in Egypt, 458; in N. Africa, 465; Arabo-Berbers, racial characteristics, **468–71**; Tuareg, **471–74**; tribesmen of Algeria and Tunisia, 476; in Morocco, 484; in Portugal, 495; Syrian Bedawin, 623; in Turkestan, 634, *ill.*, Plate 3, *fig.* 6; Mediterraneans, *ill.*, Plate 16, *figs.* 1–6; *ill.*, Plate 21, *fig.* 2; Dinaric, *ill.*, Plate 43, *figs.* 1, 3.

Aran Isles, racial study of, 379, 381; *ill.*, Plate 29, *figs.* 5, 6.

Arcadia crania, placed, 101.

Ardennes, Neolithic sites, 117.

Argolis crania, described, **144–45**.

Ariège crania, placed, 149.

Arii, origin, 602.

Arm length; *see* Body form.

Armenia, Neolithic sites, 86; Neolithic

remains, 102; Iron Age crania, 201; Gypsies in, 504; Seljuks in, 618; racial study of, 622, **625–29.**
Armenians, and Bronze Age Cypriotes, 139, 140; areas occupied by, in Iron Age, 176–77, *chart;* speech classified, 179; Iron Age crania and Avars, 232; racial characteristics, 261, 266, 268, **625–29;** in Iran, 416; in France, 512; in Rumania, 612; in Turkey, 618; distribution, 631, *map; ill.*, Plate 15, *fig.* 3; Plate 17, *fig.* 3; Plate 42, *figs.* 1–4.
Armenoids, and Ofnet K 1809, 67; in Mesopotamia, 88; among Magyars, 233; mandible, 268; in Deniker's system, 281, 282; in Czekanowski's system, 288, 289; classified, 293; geographic distribution, 294–95, *map;* element in Italy, 558, in Poland, 567, in Ukrainians, 571, in Kirghiz, 581, in Tajiks, 637; discussed, **628–29;** compared with Jews, 645; blend resulting in, 647; *ill.*, Plate 42, *figs.* 1–4.
Art, Sumerian, *ill.* 89, *figs.* 17–20, 90, *fig.* 21, Egyptians, *ill.* 97, *figs.* 22–25; Hittite, *ill.* 137, *fig.* 26; Egyptian pictures of Asiatics, 138; Minoan, 141; Greek, evidence on pigmentation, 145, 146; Greek and Roman sculpture of Kelts, 190; Scythian, 198–99; Germanic, 202–203; Egyptian drawings of Jews, *ill.*, 433, *figs.* 33–36; Italian and Bolognese, 559.
Artificial deformation: *see* Deformation, artificial.
Ashkenazim Jews, described, 437, 438; racial study of, **642–46;** *ill.*, Plate 45, *fig.* 2.
Asia, Bronze Age in, 135–40; origin of Indo-Europeans, 179; Iron Age in, 226–27; stature, 255; head sizes, 266; hairiness, 278; nasal changes, 279; Deniker's classification in, 281.
Asia Minor, invasion of Nasili speakers, 135; origin of Dinarics, 140; Greek colonies in Bronze Age, 145; modern brachycephals compared with el Argar, 151; Keltic invasion, 187; brachycephaly in, 261; nasal index, 268.
Asine crania, described, 144.
Asselar skeleton, described, **60–61.**
Assyrians, language, 175; identified, 623; racial characteristics, **630;** Dinaric, *ill.*, Plate 40, *fig.* 4.
Assyrioid, in Deniker's system, 281, 282.
Aterian culture, described, **39–41.**
Athenians, modern resemblance to, 146.
Atlanto-Mediterraneans, in Deniker's system, 281; classified, 289, 290, 292; geographic distribution, 294–95; among Yemenis, 408; element in Mesopotamia, 413, in Portugal, 498, in Basques, 504, in France, 522, in Germany, 535, 545, in Austria, 552, in Italy, 554, 555, 556, 559, in Dalmatia, 591, in Albania, 601, in Dinarics, 602, in Greeks, 606, 607, in Cretans, 608, 609, in Bulgars, 611, 612, in Vlachs, 617; S. W. Europe, *ill.*, Plate 23, *figs.* 1–4; blue-eyed, *ill.*, Plate 24, *figs.* 1–4.
Augst crania, described, 212.
Aunjetitz culture, described, **162–65;** forerunner of Hallstatt, 182; and Illyrians, 186; compared with "Danes' Grave," 191, 192, with Scyths, 199, with Germanics, 207; survivals, 260; in Germany, 536.
Aurignacian culture, crania of, 30; chronological and geographical differentiation in Europe, **33–39;** described, in E. Africa, **44–46;** compared with Magdalenian, 47; cranium, *ill.*, 52, *figs.* 5, 9; survival into Mesolithic, 57; compared with Elmenteitans, 59, with Asselar man, 60, with Tèviec, 65, with Iron Age Norwegians, 204; in Palestine, 61; Tanged-point derived from, 70; Creswellian and, 75; as origin of Alpine brachycephals, 119; in Spain, 489.
Australians, survival of, 17; and Indo-European speech, 180; hair, 278; in Deniker's system, 281, 282; relation to Veddoids, 430.
Australoid, as race, 5.
Austria, Bell Beaker in, 156, 157; Bronze Age in, 162, Hallstatt culture in, 182–83; Keltic in, 189–90; Alemanni in, 206; W. Germanics in, 211; Lombards in, 213; Slavic invasion, 217; brachycephaly in, 260; racial study of, 547, **550–54;** language distribution, 561, *map;* Jews in, 642; Neo-Danubian, *ill.*, Plate 31, *fig.* 4.
Avars, influence on Hungarian Slavs, 220; racial characteristics, **228–30;** relation to Huns, 231; European influence, 296; migrations, 577; in Hungary, 584; element in Magyars, 584.
Aveline's Hole skull C, as Crô-Magnon, 49.
Aveyron crania, placed, 149.

Awjila people, racial characteristics, **468–69.**
Azerbaijani, origin, 239, 240; speech, 416; racial characteristics, 264, 268, **424–25;** identified, 630; distribution, 631, *map.*
Azilian culture, in France, **65–66;** relation to Ofnet crania, 67; influence on Creswellian, 75.

Babylonians, politics and language, 174, 175; capture of Jews, 432, 435–36.
Badarian culture, described, **94–95;** compared with Naqada, 95, with N. Africans, 99.
Baden, Danubian settlers, 105; crania, 109, 539.
Ba'ij Bedawin, identified, 413.
Baikal, Lake, crania placed, 126.
Barraks, defined and described, **595–97.**
Bajuvars, described, 211–12, 537; and Miesbachers, 545. *See also* Bavarians.
Bakhtiari, described, 418.
Balearic Islands, in Copper Age, 148–49; racial characteristics, 257, 498.
Balkans, as route of Neolithic, 101; invasion by Turks, 229; pigmentation in, 269; hairiness in, 278; migration of Jews to, 436; Gypsies in, 507; language distribution, 561, *map;* racial history discussed, 589. *See also* individual countries and races.
Baltic Finns, classified, 223; language stock, 339, *chart;* migrations, 217, 339–40; racial study of, **351–59.** *See also* Finns.
Baltic States, glaciation and, 19; Mesolithic chronology in, *chart,* 70, *fig.* 16; speech, 179; stature, 254.
Baltics, E., classified, 292; geographic distribution, 294–95, *map; ill.,* Plate 7, *figs.* 1–5.
Balts, distribution in Iron Age, 176–77, *chart,* 216; relation to White Russians, 568.
Baluchi, language distribution, 416; in Iran, 417; racial characteristics, **430–31.**
Baluchistan, Copper Age cranium, 87; head size in, 266.
Banded pottery, described, 105.
Barbary, E., races described, **474–79.**
Baria, identified, 447–48; described, **457.**
Barrows, described, 110.
Bashkirs, language distribution in Europe, 339, *map;* classified, 577; racial characteristics, **578–79;** *ill.,* Plate 3, *fig.* 3.
Basques, Bronze Age, 152; language, 178, 512; head size, 265; racial study of, **501–504;** *ill.,* Plate 12, *fig.* 1; Plate 23, *fig.* 4.
Basses Pyrenees crania, placed, 149.
Batavii, distribution, 529.
Bath, Roman burials, 195.
Battle-Axe people: *see* Corded people.
Bavaria, Ofnet skulls in, 66–68; Danubian settlers in, 105; Bavarians enter, 206; W. Germanics in, 211; brachycephaly in, 260.
Bavarians, origin, 206; pigmentation, 272; Miesbachers, racial characteristics, 545; compared with Czechs, 562. *See also* Bajuvars.
Bazaiha cranium, described, 126.
Beaker: *see* Bell Beaker, Zoned Beaker.
Beaune crania, placed, 191.
Bedawin, described, 402; Syrian, racial characteristics, **623;** Ruwalla, *ill.,* Plate 16, *fig.* 4; Plate 19, *fig.* 6.
Bedawin, Veddoid: *see* Hadhramis.
Beja, distribution, 457; *ill.,* Plate 20, *fig.* 5.
Bektashi, identified, 621.
Belgae, in British Isles, 371; in Belgium, 523; in Netherlands, 529.
Belgium, glaciation and, 19; Neolithic in, 117–18, 124; Kelts in, 187; Franks in, 206, 214–15; stature, 254; cranial measurements in, 257, 260, 264, 265; racial study of, **522–29.**
Bell Beaker culture, in Spain, **148–50;** in lands north of Mediterranean, **155–57;** in British Isles, **157–62;** influence on Aunjetitz, 162, 163; influence on Rhine, 164; in France, 165–66, in Poland, 168; relation to Hallstatt, 184, to Glasinac, 185, to German Kelts, 189; movements in Bronze Age, 132–33, *chart;* stature survival, 254; in Netherlands, 530; in Germany, 535, 536; in Poland, 563.
Beni Amart, identified, 480.
Beni Amer, described, 457.
Beni Bu Yahi, identified, 480.
Beni Hillal, invasions, 467.
Beni Khattab, identified, 480.
Beni Said, cranial measurement, 481.
Beni Soleim, invasions, 467.
Beni Urriaghel, identified, 480; racial characteristics, **483.**
Berbers, teeth modifications among, 29; stature, 255; dolichocephaly in, 257; in Deniker's system, 281, 282; Judaism and, 438; language distribution in

N. Africa, 462, described, 463, 467; Arabo-Berbers, racial characteristics, **468–71;** Barbary, Algeria, Tunisia, racial characteristics, **474–79;** mountain, racial characteristics, 474, **476–79;** in Morocco, 480–84; in Portugal, 495; relation to Corsicans, 499.
Berkshire crania, described, 192.
Berr ibn Botr, identified, 463.
Berr ibn Branes, identified, 463.
Bessarabia, Neolithic remains, 102; Scythian crania, 199.
Bibliography, 692–700.
Bilikani Kurds, racial characteristics, **422.**
Biniatap crania, placed, 149.
Bisharin, described, 457, *ill.*, Plate 20, *fig.* 5.
Black Hats: *see* Kara Kalpaks.
Blondism: *see* Pigmentation.
Bodrogkeresztur crania, described, 155.
Body form, discussed, **251–56;** Danes, 334; Carelians, 343; Syryenians and Permiaks, 349; Ostiaks and Voguls, 350; Livs, 352; Esths, 354; Finns, 357; Letts, 362; Lithuanians, 366; Irish, 377, 379; Aran Islanders, 379; Great Britain, 391–92; Yemenis, 403–04; Hejaz, 409, Mesopotamians, 412; Kuwaitis, 413; Persians, 418; Afghans and Pathans, 419; Turkomans, 423; Hadhramis, 427; E. African Hamitics, 449–50, 456; modern Egyptians, 459; Awjila, 468; Tuaregs, 472; Mzabites, 475; Kharejites, 475; Kabyles, 478; Riffians, 480–81; Basques, 502; French, 515; Flemings and Walloons, 527; Frisians, 533; Fehmarn Germans, 540–41; Genkingen Germans, 544; Italians, 556; Poles, 564–65; Volhyn Ukrainians, 570; Bashkir, 578; Meshcheryaks, 578; Kirghiz, 579; Serbs, 589; Montenegrins, 592; Albanian Ghegs, 597; Toscs, 602; Lebanese, 623; Armenians, 626; Tajiks, 636. *See also* Skeletal measurements.
Bohemia, Neolithic invasion of, 82; Danubian settlers in, 104; Corded skulls in, 107; amber trading route, 134; Bell Beaker in, 156, 157; Bronze Age in, 162; Hallstatt culture in, 184; boundary of Kelts, 186; La Tène culture in, 189; Kelts in, 191; Thuringians in, 206; Slavs in, 219, 560; brachycephaly in, 260; migration of Jews to, 437, 642.
Boii, and Thuringians, 213.
Bokharans, Jews, *ill.*, Plate 46, *figs.* 6, 7.
Bolgars, classified, 223; entry into Bulgaria, 224; joined by Huns, 228, 341. *See also* Bulgars.
Bolognese, racial characteristics, **558–59.**
Bornholm, racial study of, **335–36.**
Borreby culture, placed, 124; described, **129;** in Bronze Age Britain, 158, 159; extent of, in Iron Age, 176–77, *chart;* relation to Hallstatt, 184, to German Kelts, 189, to Iron Age Norway, 205; survival in Germany, 265, 535, 539, 540, 543–44; head size survival, 266; classified, 289, 290; survivors in Europe, 291; geographic distribution, 294–95, *map;* survival in Norway, 319, in Sweden, 332, in Denmark, 333, 334, 335, in Great Britain, 371, 396, in Belgium, 526, 529, in Netherlands, 530–31, 534, 535, in Albanians, 598, 600; and Alpine in central Europe, 511; and French Alpines, 518; survivors in North, *ill.*, Plate 5, *figs.* 1–5; survivors in Germany, White Russia and Italy, *ill.*, Plate 6, *figs.* 1–5; survivors in Carpathians and Balkans, *ill.*, Plate 8, *figs.* 1–6; Nordic blend, *ill.*, Plate 34, *figs.* 1–4.
Bosnia, Hallstatt culture in, 182, 184.
Bosnians, language distribution, 561, *map;* classified, 587; racial study of, **590–91.**
Boulogne crania, described, 214.
Brabers, speech, 462, 467; origin, 463; distribution, 480; racial characteristics, **484.**
Brachycephaly, as environmental response, 10–11; Alpine, hypotheses concerning, 119; in modern Europe, 257, 260–61; associated with large head size, 265, 266. *See also* Cephalic index, Cranial measurements.
Brahui, racial characteristics, 266, 431.
Bretons, language, 512; racial characteristics, 514, **520.**
Bristol crania, described, **374–75.**
British Isles, glaciation and, 19; Mesolithic in, **75–76;** Megalithic invasion, 82; Englishmen compared with Sumerians and Egyptians, 83; Neolithic in, **109–113;** Bell Beaker culture in, 148; Bronze Age in, 131, **157–62;** Urnfields invasion, 171; Kelts in, discussed, 187, **191–93;** Romans in, 194–95; invasion by Anglo-Saxons, 208, by Danes, 211, by Normans, 211; Iron Age language, 214; Bronze Age crania compared with

Turks, 235; stature, 254; dolichocephaly in, 257; brachycephaly in, 261; pigmentation, 276; Norwegian migration, 308; Norse invasions, 323; settlers in Iceland, 324; thralls in Sweden, 327; Danish settlements, 333; racial study of, **370–99**; Mediterranean types, *ill.*, Plate 25, *figs.* 1–4; Danubian type, *ill.*, Plate 28, *fig.* 2; Hallstatt and Keltic types, *ill.*, Plate 29, *figs.* 2–6; Dinaric, *ill.*, Plate 36, *fig.* 1. *See also* Great Britain, Ireland, Scotland.

Brittany, Bronze Age in, 165. *See also* Bretons.

Bronze Age, discussed, **131–73**; in W. Asia, 135–40; Minoans in, 140–42; in Western Mediterranean, 146–52, Basques, Phoenicians, Etruscans, 152–54; in central Europe, 162–66; in Scandinavia, 166–68; in Eastern Plains, 168–70; cremation and final stage, 170–71; survival in British Iron Age, 192; in British Isles, 371; survival in Scotland, 376; in France, 512; in Italy, 554.

Brünn crania, described, **36**; survival of head size, 265; classified, 289, 290; survivors in Europe, 291; strain, geographic distribution, 294–95, *map;* types, in Sweden, 332; as Irish ancestor, 378; element in Netherlands, 531, 534; survivors in Scandinavia, *ill.*, Plate 4, *figs.* 1–4.

Brythonic: *see* P-Keltic.

Bulgaria, Copper Age crania in, 155; movement of Bulgars to, 224.

Bulgars, racial characteristics, 272, **609–12**; language, 341; language distribution, 561, *map;* in Crimea, 582; in Yugoslavia, 587; invasion of Bulgaria, 610; in Dacia, 613; *ill.*, Plate 26, *fig.* 1. *See also* Bolgars.

Burgundians, speech, 205; origin, 327; migration, 536.

Burgwall villages, and Slavic origins, 216.

Burials, and racial study, 14; Swiss cist, 114–15; French Neolithic, 117; Bronze Age W. Mediterranean, 148; Bell Beaker, 150; Food Vessel, 160; Scythian, 197, 200; Germanic Iron Age, 202; ship, 202.

Burushaski, language, placed, 175, 417; racial characteristics, **421**.

Buryats, compared with Huns and Avars, 231; racial type, 235; European influence, 296.

Bushmen, as race, 5; survival of, 17; compared with Wiltonians, 59; relation to Asselar man, 61; in Deniker's system, 281; ancestry, 445.

Byzantines, placed, 146; mention of Slavs in writings of, 218.

Canaanites, described, 432.

Canary Islanders, speech, 462; racial characteristics, **485–88**.

Cappadocians, described, 85; Luristan crania, 87; in Bronze Age, **137–39**; distribution, in Iron Age, 176–77, *chart;* classified, 289, 290; element in ancient Jews, 434, in Spain, 491, in Italy, 559, in Dinarics, 601, in Osmanli Turks, 621, 622, in Caucasic-speakers, 634.

Capsian culture, described, **39–41**; in Spain, 47; in N. Africa, 59.

Carelia, Baltic Finns in, 340.

Carelians, language distribution in Europe, 339, *map;* language stock, 339, *chart;* described, 340–41; racial study of, **342–45**; compared with Permians, 349, with Livs, 352.

Caries, early examples, 43.

Carniola crania, described, 184, 185.

Carthagians: *see* Phoenicians.

Carthage crania, described, 153.

Catalan, in France, 512.

Catalonia, Hallstatt culture, 182.

Caucasic languages, origin, 175; speakers of, 631; distribution, 631, *map.*

Caucasus, glaciation and, 19; Bronze Age in, 169; Iron Age language, 175; as iron center, 181; racial study of, 622, **630–34**; distribution of races in, 631, *map;* Jews in, 641–42.

Celts: *see* Kelts.

Centum, described, 179.

Cephalic index, in modern Europe, **256–61**, 258–59, *map. See also* Cranial measurements.

Cerdic, conquests, 208.

Cerro de Tomillo crania, described, 150.

Chalcolithic: *see* Copper Age.

Chamblandes skeletons, described, 115.

Chancelade crania, described, **47, 48**; compared with Afalou, 41, with Tèviec, 66; in racial classification, 290, *chart;* compared with Lapps, 298.

Chatelperronian skeletons, described, 33.

Chatti, origin, 206; in Germany, 537.

Chaudir, stature, 422; racial characteristics, **424**.

Chechens, distribution, 631, *map;* racial characteristics, **633.**
Cheremisses, distribution in Europe, 338, *map;* language stock, 339, *chart;* placed, 340; Bolgars and, 341; racial characteristics, 342, **345–47**; compared with Great Russians, 575–76.
Cherkesses, in Bulgaria, 610; distribution, 631, *map;* racial characteristics, **633–34**; *ill.*, Plate 17, *fig.* 4.
Chersonese crania, described, 206.
China, Upper Palaeolithic man in, 49–50; historians, 174; Iranians in, 227; Jews in, 438; Assyrians in, 630.
Chinese, in Turkestan, 634.
Chiusella crania, described, 147.
Chou Kou Tien crania, described, 49–50.
Chude, described, 300.
Chuvash, language distribution in Europe, 338, *map;* origin, 341; and Votiak speech, 347; racial characteristics, **577–78**; *ill.*, Plate 3, *figs.* 1, 2; Nordic, *ill.*, Plate 30, *fig.* 2.
Ciči, identified, 614.
Ciempozuelos crania, described, 150.
Cimbri, origin, 333; in Netherlands, 530.
Cimmerians, ousted by Scyths, 196; compared with Scyths, 201; contact with Finno-Ugrians, 224; element in Ukrainians, 569; in Crimea, 582.
Cipley crania, described, 214.
Circassians: *see* Cherkesses.
Classification, of races, **279–96**; Blumenbach's, 280; Topinard's, 280; Deniker's, 280–83; Sergi's, 283–84; Ripley's, 284–85; von Eickstedt's, 286–88; Czekanowski's system, 288–89; author's, 289–96; schematic representation, 290, *chart;* geographic, 294–95, *map.*
Climate, shifts and glacial retreat, 56; and Palaeolithic culture, 69; Neolithic, 78, 79; post-glacial in Egypt, 92; Bronze Age, 134–35, 168, 170; effect on Neolithic Age, 220–21; relation to body weight, 256; and head size, 267; and pigmentation, 276–77; effect on Norwegians, 308–309; in ancient Spain, 489.
Clothing, effects of, 16; appearance of, 20; trousers, Iron Age, 188; Scythian, 199; Lapps, 298.
Cockney, origins, 375.
Collognes, crania described, 214.
Combe Capelle cranium, described, **34**; compared with Brünn #1, 36, with Gamble's Cave, 44, 45, with Chancelade, 48, with Elmenteitan, 57, with al 'Ubaid, 87, with Afalou #28, 40; cranial measurements, 37; *ill.*, 52 *fig.* 5; relation to Mediterraneans, 83; in racial classification, 290, *chart.*
Combed Pottery culture, described, 125.
Coopers, identified, 506.
Copper Age, Baluchistan and Sumeria crania, 87; crania in Italy, 101; relation to Bronze Age, 131–32; north of Mediterranean lands, 154–57. *See also* Bronze Age.
Coptic, classified, 445.
Copts, described, 96; racial characteristics, **459–61.**
Corded people, example of selection, 7; origin, 82; characteristics, 85; described, **107–109**; compared with Long Barrow, 111, with French Neolithic, 116; invasion of Switzerland, 113; influence on Danish Neolithic, **122–23**; route traced, 128; in Asia Minor, 136; in Bronze Age Greece, 144, 145; in Copper Age Hungary and Switzerland, 155; amalgamation with Bell Beaker, 156, 157; element in Bronze Age Britain, 158, 159; influence on Aunjetitz, 162; element in Saxo-Thuringia, 164; and Esthonian Bronze Age, 167–68; in Bronze Age Scandinavia, 168; language, 178, 237, 238; and diffusion of Indo-European, 180; and Hallstatt, 183, 184; and Iron Age Norwegian, 204; movements in Bronze Age, 132–33, *chart;* influence on Anan'ino, 225; racial influence, 239; European survivals, 254, 265, 286, 319; classified, 289, 290, in Sweden, 327, 330, 332; in Denmark; 333; in British Isles, 371; in Turkomans, 424; in Frisians, 534; in Neolithic Germany, 535, 536; in Poland, 563–64, 567; in Great Russians, 575; survivals, *ill.*, Plate 27, *figs.* 1–4.
Corneto Tarquinia cemetery, contents described, 194; compared with Rheinzabern, 195.
Cornwall, speech, 373; pigmentation, 389; stature, 390; racial characteristics, 389, 390, 396; Cornishmen in France, 512, 514.
Corsica, Copper Age in, 147; dolichocephaly in, 257.
Corsicans, racial characteristics, **498–500.**
Crania, number studied in prehistoric periods, 14; criteria in measurement of, 15. *See also* individual crania.

Cranial measurements, criteria for, 15; techniques discussed, **241–42**; difficulties of varying techniques, **243–44**; measuring anthropometric differences, **247–48**; distributions in modern Europe, **256–68**; cephalic index in modern Europe, 258–59, *map;* head size in modern Europe, 261–67; head size, 262–63, *map;* and pigmentation, 277; means of principal cranial series, **655–65**; negro-whites and Ethiopians, 4–5. *Pleistocene:* Galley Hill man, 21–22; Kanjera skulls, 23; Skhul, 27–28; Upper Palaeolithic, 32, 37, 84; Combe Capelle, 34; Crô-Magnon, 35; Solutré #2, 36; Neanderthal, 37, 38–39; Předmost #5, 37; Afalou, 41; Gamble's Cave and Oldoway, 45; Elmenteitan, 58; Asselar man, 60; Erg el Ahmar, 61; Natufians, 62; Muge midden dwellers, 63–64; Tèviec, 65; Ofnet, 67; Stångenäs, 73; Pritzerber, 73; MacArthur Cave B., 75. *Neolithic:* Mediterraneans, 84; Danubian, 85; Megalithic, 85; al 'Ubaid, 87; Eurafrican, 88; Kish, 88; Tasian, 93; Badarian, 94; Copts, 96; ancient Egyptians, 96; Megalithic N. Africans, 99; Anau I, 102; Banded and Painted, 106; Corded, 109; Long Barrow, 111; Lake Dwellers, 114; French Neolithic, 116, 117; L'Homme Mort, Lozère, 116; Belgian Neolithic, 118; Danish and Swedish Neolithic, 122; Scandinavian Neolithic brachycephals, 123; Salis Roje, 126. *Bronze Age:* Alishar, 136; Megiddo, 138; early Cypriote, 138; Minoan, 141; Hagias Kosmas, 144; Asine, 144; Copper Age Sicilians, 147; Minorca, 149; el Argar, 151; Carthage, 153; Etruscan, 154; Bodrogkeresztur, 155; Bell Beaker, 156, 158, 159; Irish Food Vessel, 161; Gemeinlebarn, 163; Aunjetitz, 164; Franche Comté, 165; Esthonian Bronze Age, 167; Bronze Age Ukraine, 168; Minussinsk, 169, 170. *Iron Age:* Hallstatt, 183; Glasinac, 184; German Kelts, 188–89; La Tène, 189; Gauls, 190–91; Goidelic, 191; Berkshire skulls, 192; early Roman, 194; Novilara Illyrians, 195; Scyths, 199, 200; Sarmatian, 200; Sevan skulls, 201; Iron Age invaders of Scandinavia, 203; Norwegian Iron Age, 204; Anglo-Saxon, 209, 210; Bajuvars, 211; Alemanni, 212; Nikitsch and Vinzen, 213; Franks, 215; Iron Age slavs, Polish, 218; Wends, 219; Ukrainian Slavs, 219; Russian Slavs, 219; Anan'ino, 225; Mordvins, 225; Huns, 230; Avars, 230; non-Mongoloid Avars, 232; Petcheneg and Kuman, 234. *North:* Lapps, 303; Norwegians, 309, 310, 312, 313, 315, 316, 317, 318, 319, 320; Icelanders, 325; Swedish, 329, 331; Danish, 334; Faroe Islanders, 336; Carelians, 343; Ijores and Vodes, 345; Vepses, 345; Mordvins and Cheremisses, 346, 347; Votiaks, 347; Livs, 352; Esths, 354; Runö Swedes, 355; Finns, 357; Letts, 362; Lithuanians, 366; Lithuanian Tatar, 368. *British Isles:* Scotsmen, 376, 392–93; Irish, 377–78, 379; and religion, in Ireland, 378; Aran Islanders, 379; Great Britain, 392; Welsh, 392, 398; British, correlation with stature and pigmentation, 395–98. *Mediterranean:* Yemenis, 404, 407; Hejaz, 409; Ruwalla, 410; Mesopotamians, 412; Kuwaitis, 413; Omanis, 414; Lenja, 414; Persian, 418; Afghans and Pathans, 419; Dardic speakers, 420; Burushaski, 421; Kurds, 421; Bilikani Kurds, 422; Turkomans, 422; Azerbaijanis, 425; Hadhramis, 427, 428; Baluchis and Brahui, 431; Samaritans, 439; Palestine Jews, 439; Yemenite Jews, 440; Mesopotamian Jews, 442, 443; N. African Jews, 443; E. African Hamites, 450–51; modern Egyptian, 459; Khargan, 461; Siwans and Awjila people, 468; Magiabras, 469; Marabutic tribes, 470; Arabo-Berbers, 470; Tuareg, 472; Mzabites, 475; Kharejites, 475–76; Kabyles, 478; Riffians, 481; Ghomara, 483; Shluh, 484; Guanche, 486; Canarians, 487; Spaniards, 491, 492–93; Spanish Moors, 495; Portuguese, 496–97; Corsicans, 499; Sardinians, 500; Basques, 502, 503; Gypsies, 506–07. *Central Zone:* French, 515–17, 518; Saaftigen, 526; Belgians, 527–28; Friterpian and Groterpian, 531; West Frisian, 531; Groningen people, 531; Zuid Beveland, 531–32; Netherlands, 532; Frisian, 533–34; old South German, 538–39; German, 539; Fehmarn Germans, 265, 540; Vogelberg Germans, 542; Keuperfranken Germans, 543; Lake Constance Germans, 543; Alemanni, 545; Miesbacher Germans, 545; Questenberger Germans, 545; Sudeten

Germans, 546; Swiss, 549; Lower and Upper Austria, 551; Tyrol, 552–53; Pompeiian, 555; Italians, 555, 556, 558; Bohemian Czechs, 560; Czechs, 562; Wends, 562; Poles, 565–66; White Russians, 568; Kiev Ukrainians, 571; Ruthenians, 571; Hüzül Ruthenians, 572; Great Russians, 573–74; Chuvash, 577; Bashkirs, 578; Meshcheryaks, 578; Kirghiz, 579–80; Crimean Tatars, 583; Kalmucks, 583; Magyars, 585; Slovenes, 588; Croats, 588; Serbs, 589–90; Bosnians, 590; Dalmatians, 591; Montenegrins, 593; Albanian Ghegs, 597–98; Toscs, 602–03; Greeks, 604–05, 606; Cretans, 608; Bulgars, 610–11; Vlachs, 614–15, 616–17; Osmanli Turks, 619, 621, 622; Syrian Bedawin, 623; Syrians, 623; Cypriots, 625; Armenians, 626; Assyrians, 630; Tats, 632; Ossetes, 632; Caucasic-speakers, 633; Tajiks, 636; Turkestan Jews, 639–40; Caucasus Jews, 641; Karaite Jews, 642; Ashkenazim Jews, 644.

Cremation, and racial study, 14; growth of, 166; at end of Bronze Age, 170–71; effect on Lausitz culture, 188; Slavic, 217–18; Bronze Age, in British Isles, 371.

Creswellian culture, appearance of, 75.

Cretans, later, compared with Minoans, 142; language group, 175; racial characteristics, 272, 608–09; *ill.*, Plate 22, *fig.* 1. Cretans, Bronze Age: *see* Minoans.

Crete, Neolithic in, 82, 101, Bronze Age in, 135, **140–42.**

Crimea, racial study of, 582–83; Jews in, 641–42.

Crimean Tatars, racial characteristics, 577, **582–83.**

Croatia crania, described, 184.

Croats, language distribution, 561, *map;* racial characteristics, 587, 588; Dinaric, *ill.*, Plate 38, *fig.* 3.

Crô-Magnons, described, 35–36; *ill.*, 35; compared with Afalou, 41–44; facial characteristics, 42; relation to Lake Ladogia, 125–26; European survivals, 285–86, 291; as Irish ancestor, 378.

Cruithni, language, 187; in Ireland, 372.

Cumans: *see* Kumans.

Cunama, identified, 447–48; described, 457.

Cushites, Highland, distribution, 446.

Cushitic, language classified, 445; distribution in E. Africa, 446, *map.*

Cycladic, influence on Minoan, 142; in Bronze Age Greece, 144.

Cypriots, racial types in Bronze Age, *ills.*, 139, *figs.* 27, 28; in Bronze Age Greece, 145; compared with Minoans, 142, with Narbonne, 149, with Etruscans, 154, with British Bell Beakers, 159, with Short Cist, 160, with Glasinac, 185; racial characteristics, **625.**

Cyprus, Bronze Age in, 135, 138–40; racial study of, 624–25.

Cyrenaicans, language, 467.

Czechoslovakia, Bell Beaker in, 156; language distribution, 561, *map.*

Czechs, racial study of, **559–62;** *ill.*, Plate 12, *fig.* 4; Plate 26, *fig.* 4.

Dacians, described, 613.

Daggatuns, identified, 438.

Dalmatia, Vlachs in, 614.

Dalmatians, classified, 587; racial characteristics, **591.**

Dalo-Nordic, in von Eickstedt's system, 288.

Danakil, distribution, 447; described, 457.

Danes, in British Isles, 211, 373, 389; racial characteristics, 254, 273, **332–37;** Neolithic culture in Netherlands, 530; Borreby type, *ill.*, Plate 5, *fig.* 1; Corded type, *ill.*, Plate 27, *fig.* 3; Upper Palaeolithic Nordic, *ill.*, Plate 33, *fig.* 2. *See also* Denmark.

"Danes' Grave," contents discussed, 191–92.

Danubians, movement traced, 81–82, *map* 2; characteristics, 85; in S. Russia, 104; as culture bearers, 105–07; compared with French Neolithic, 116; route traced, 127; in Bronze Age Greece, 144; origin of, 172; speech unknown, 178; as original Indo-Europeans, 180; relation to Hallstatt, 184; movements in Bronze Age, 132–33, *chart;* crania compared to Finns, 225; migration and language, 237; survivals, 254, 260, 265; classified, 289, 290; geographic distribution, 294–95, *map;* element in Germany, 535, in Ukrainians, 570, in Great Russians, 574, in Caucasic-speakers, 633–34; *ill.*, Plate 28, *figs.* 1–4.

Dardic language, distribution, 416; Kafirs, 417; speakers described, 420–21.

Deformation, artificial, in Cyprus and Egypt, 139; in Caucasus, 169; Thurin-

gian, 212; in Albania, 600; Armenians, 628.
Deir Tasa, site of Tasian culture, 93.
Denmark, Ertebølle culture in, 72; Neolithic skulls, 122; brachycephaly in, 123; amber trading route, 134; Bell Beakers in, 157; Bronze Age in, 166–67; Germanic expansion, 181; Germanic peoples in, 202; Iron Age crania, 203–04, 207. *See also* Danes.
Dibra, classified, 595; distribution, 596, *map.*
Dinarics, first appearance and origin, 140; and Bronze Age Cypriots, 140; type, in Bronze Age Greece, 145; Copper Age sailors, 146–47; arrival in Copper Age Italy, 148; Bell Beaker people in Spain as, 150; among Basques, 152; in Carthage, 153; in Rhineland, 156–57; modern derivation, 157; element in British Bell Beaker, 159; influence on Aunjetitz, 163, appearance of, 172–73; distribution in Iron Age, 176–77, *chart;* among Magyars, 233; racial characteristics, 254, 266, 268, 278; in Deniker's system, 282, 283; in von Eickstedt's system, 287; in Czekanowski's system, 288, 289; classified, 293; geographic distribution, 294–95, *map;* in British Isles, 371; in Ireland, 377, 383; element in ancient Jews, 434, in Spain, 490, 491, in Portugal, 497, in Basques, 503, in France, 521, 522, in Frisians, 534, in Germany, 535, 536, 538–39, 541, 542, 543, 544, 545, 546, 547, in Switzerland, 550, 552, 553, in Austria, 551, in Italy, 554, 555, 559, in Czechs, 562, in Poland, 563, 566, 567, in Ukrainians, 571, in Ruthenians, 572, in White Russians, 576, in Magyars, 586, in Yugoslavia, 587, in Slovenes, 588, in Serbs, 589, in Montenegrins, 592, 594, 595, in Albanians, 597, 598, 599, 600, 601, in Greeks, 606, 607, in Bulgars, 611, 612, in Vlachs, 615, 616, 617, in Lebanese, 624, in Cypriots, 625, in Ossetes, 632, in Tajiks, 637, 638, in Turkestan Jews, 640, in Caucasus Jews, 641; theory of hybridization discussed, **601–02;** relation to Armenoids, 626, 627, 629; blend resulting in, 647; principle of, *ill.*, Plate 35, *figs.* 1–4; types, *ill.*, Plate 36, *figs.* 1–4, Plate 37, *figs.* 1–4, Plate 38, *figs.* 1–4, Plate 39, *figs.* 1–6, Plate 40, *figs.* 1–4, Plate 41, *figs.* 1–4, Plate 43, *figs.* 1–6.
Dobruja district, language distribution, 561, *map;* racial complexity, 612–13.
Dolichocephaly, in modern Europe, 256, 257–59. *See also* Cephalic index, Cranial measurements.
Domestic animals, in Mesolithic period, 56; of Muge midden dwellers, 63; Neolithic husbandry, 78; date of beginning, 79; Fayum, 93; Danubian, 105; Corded, 107, 108; horse as traction animal, 135; Indo-Europeans and, 178; influence on Indo-European vocabulary, 180; Iranian, 227; horse culture, 235, 237, 238, 239, 323; reindeer culture, 239, 299; cattle complex in Africa, 444–45; camels in Africa, 445, 466.
Dömitz crania, described, 74.
Dorians, invasion of Crete, 142; relation to Sphakiots, 608.
Drang nach Osten, racial origin, 537.
Dravidians, relation to Badarians, 95; in Deniker's system, 281, 282.
Druzes, identified, 623; brachycephaly, 261; *ill.*, Plate 15, *fig.* 2; Dinaric, *ill.*, Plate 41, *fig.* 4.
Dukagin, classified, 595, distribution, 596, *map;* racial characteristics, 597, 598, 600, 601.
Dunstable crania, described, 210.
Dutch: *see* Netherlanders.

East Shefford crania, described, 210.
Edomites, identified, 434.
Egypt, Neolithic, 78, **91–98;** use of metal, 131–32; invasion of Hyksos, 135; influence in Bronze Age Spain, 148; Gypsies in, 504; Turks in, 618.
Egyptians, compared with Englishmen and Neolithic Swiss, 83, with Long Barrow, 111, with Chamblandes, 115, with Minoans, 141; Neolithic, 91–98, 128; study of, through politics and language, 174; language, 175, 445; burials compared with Scythians, 197; dolichocephaly, 256; racial classification by, 279; drawings of Jews, *ill.*, 433, *figs.* 33–36; modern, racial characteristics, **458–62;** on ancient Libyans, 464.
Eire: *see* Ireland.
el Argar crania, described, **150–51;** compared with Etruscan, 154.
Elmenteitan culture, men described, **57–59;** facial characteristics, 85; compared with Corded, 108.
England, Magdalenian crania in, 47; Magdalenian survival in, 65; Neolithic

invasion, 82; head size, 265; migration of Jews to, 437; Gypsies in, 505, 506, 507. *See also* British Isles.
Environmental response, discussed, **9–12.**
Epirotes, racial characteristics, **604–05.**
Erg el Ahmar cranium, described, 61–62.
Eritreans, classified, 445.
Ertebølle culture, described, 72.
Eskimos, modification in masticatory muscles, 29; Magdalenian ancestry, 47–48.
Esthonia, crania described, 167–68; Mesolithic survivals in, 226; language, 338; Baltic Finns in, 340, 351.
Esths, classified, 223; racial characteristics, 254, 257, **353–55;** language distribution in Europe, 338, *map;* language stock, 339, *chart.*
Ethiopians, relationship with Badarians, 95; in Deniker's system, 281, 282; classified, 445; in Egypt, 459; *ill.*, Plate 20, *fig.* 3. *See also* Amharas.
Etruscans, Bronze Age, 152, 153–54; language, 175; distribution, 554.
Eurafrican, crania, 87, 88, compared with Neolithic Spanish, 100, with Bronze Age Trojans, 137; in Sergi's classification, 284.
Eurasiatics, in Sergi's classification, 284.
Eurybates, pigmentation, 145.
Euskarians, compared with Bronze Age Basques, 152; as linguistic stock, 178.
Evremeiset, language classified, 339.
Eye color: *see* Pigmentation.
Eye width: *see* Facial characteristics.

Facial characteristics, in modern Europe, 267–68, 278; and pigmentation, 277; *ill.*, Plates 1–46. *Pleistocene:* Grimaldi, 33; Combe Capelle, 34; Lautsch, 36; Předmost #3, 37; Afalou, 41–42; Chancelade, 48; Elmenteitan, 58; Asselar man, 60; Erg el Ahmar, 61; Natufians, 62; Muge midden dwellers, 64; Téviec, 65; Ofnet, 67; Murzak Koba, 68; Pritzerber, 73. *Neolithic:* Mediterraneans, 84; Danubians, 85; Megalithic, 85; al 'Ubaid, 87; Kish crania, 88; Sumerian, *ill.*, 89, *figs.* 17–20; Assyrian, 90–91; Tasian, 93; Badarian, 94–95; Egyptian, *ill.*, 97, *figs.* 22–25; Naqada, 95–96; Lower Egyptians, 96; Anau I, 102, 103; Banded and Painted, 106; Corded, 108; Long Barrow, 111; Lake Dwellers, 114; Alpine, 118; Swedish and Danish, 122; Scandinavian brachycephals, 123–24; Lake Ladoga, 125–26; Salis Roje, 126. *Bronze Age:* Alishar, 136; Megiddo, 138; Umm Qatafa, 138; Early Cypriote, 138; Minoan, 142; Hagias Kosmas, 144; Asine, 144; Minorca, 149; el Argar, 151; Carthage, 153; Etruscan, 154; Bell Beaker, 156, 159; Irish Food Vessel, 161; Gemeinlebarn, 163; Esthonian, 167; Caucasian, 168; Minussinsk, 169. *Iron Age:* Hallstatt, 183; Glasinac, 185; German Kelts, 189; La Tène, 189; Goidelic, 191; early Roman, 194; Novilara Illyrians, 195; Scythian, 199; Sevan crania, 201; W. Germanics, 207; Anglo-Saxon, 209, 210; Nikitsch, Vinzen, 213; Slavs, Polish, 218; Wends, 219; Anan'ino, 225; Hun, 230; Avars, 230; Petcheneg and Kuman, 234. *North:* Lapps, 303–04; Samoyed, 307; Norwegians, 310, 311–12, 314, 316, 317–18, 319; Icelanders, 325; Swedish, 329–30; Danes, 334; Faroe Islanders, 336; Carelians, 343, 344; Mordvins and Cheremisses, 346, 347; Votiak, 348; Syryenians and Permiaks, 349, Ostiaks and Voguls, 350–51; Livs, 352–53; Runo Swedes, 354; Finns, 357–58, 359; Letts, 363, 364; Lithuanians, 366, 367; Lithuanian Tatars, 368. *British Isles:* seventeenth century Londoners, 375; Scotsmen, 376; Irish, 378, 379, 381–82; Aran Islanders, 379, 381; Upper Palaeolithic, 383–84; Great Britain, 393–97; composite English, 394, *fig.* 32; Welsh, 398. *Mediterranean:* Yemenis, 404, 406–07, 408; Hejaz, 409; Ruwalla, 410; Mesopotamians, 412–13; Kuwaitis, 413, 414; Lenja, 414, 415; Persian, 418; Afghans and Pathans, 419; Dardic speakers, 420–21; Burushaski, 421; Kurds, 421; Turkomans, 423, 424; Veddoid and Negroid, 426; Hadhramis, 427–28, 429; Baluchis and Brahui, 431; Samaritans, 439; Palestine Jews, 439; Yemenite Jews, 440; Jewish, discussed, 441–42; Mesopotamian Jews, 442, 443; N. African Jews, 443; E. African Hamites, 450, 451–52, 454–55; modern Egyptians, 460; Khargan, 461; ancient Libyans, 464; Siwans and Awjila people, 468, 469; Arabo-Berbers, 470; Tuareg, 472, 473; Mzabites, 475, 476; Kharejites, 476; Algerian tribesmen, 476; Shawia, 477; Kabyles, 478, 479; Riffians, 481, 482–83; Shluh, 484;

Guanche, 486; Canarians, 487; Spaniards, 492, 493; Andalusians, 493, 494; Portuguese, 497; Sardinians, 500–01; Basques, 502, 503; Gypsies, 507. *Central Zone:* Frenchmen, 517–18, 521; Mendonck Belgians, 528–29; Frisian, 534; Fehmarn Germans, 540, 541; Vogelberg Germans, 542; Lake Constance Germans, 543; Genkingen Germans, 544; Questenberger Germans, 545–46; Sudeten Germans, 546; Swiss, 549–50; Tyrolese, 553; Pompeiian, 555; Italians, 556–57, 558; Poles, 566–67; White Russians, 568; Volhyn Ukrainians, 570–71; Ruthenians, 572; Great Russians, 574, 575; Chuvash, 577; Bashkirs, 578–79; Meshcheryaks, 578–79; Kirghiz, 580, 581; Kalmucks, 583; Magyars, 585, 586; Slovenes, 588; Croats, 588; Serbs, 590; Montenegrins, 592, 593–94; Albanian Ghegs, 598, 599–600; Toscs, 603; Greeks, 606–07; Cretans, 608; Bulgars, 611; Vlachs, 615–16, 617; Osmanli Turks, 619–20, 621; Lebanese, 624; Armenians, 626–27, 628; Assyrians, 630; Ossetes, 632; Caucasic-speakers, 633; Tajiks, 636, 637–38; Turkestan Jews, 640; Caucasus Jews, 641–42; Karaite Jews, 642; Ashkenazim, 644.

Faki, identified, 447.

Falasha, identified, 438.

Faliscans, language classified, 193; origin, 554.

Falster, brachycephaly in, 123.

Faroe Islanders, settlers in Iceland, 324; racial characteristics, **336.**

Farringdon Street crania, described, 375.

Fatjanovo culture, placed, 104; compared with Corded, 107.

Fayum people, described, 93.

Fehmarners, racial characteristics, 265, **540–41;** *ill.*, Plate 6, *fig.* 1.

Fellahin, racial characteristics, **459–61.**

Fenno-Nordic, in von Eickstedt's system, 288.

"Fertile Crescent," placed, 175.

Finger-chopping, during Upper Palaeolithic, 43.

Finland, glaciation and, 19; Lapps in, 299, 301, 302, 303; Baltic Finns in, 340; county divisions of, 355, *map;* Gypsies in, 505.

Finnmark, survival of Upper Palaeolithic implements, 57; Lapps in, 299.

Finno-Ugrian peoples, hypothesis concerning, 125; relation with Sumerian, 175; discussed, **223–26;** relation to Samoyedic, 306; racial study of, **337–68;** language relationships of peoples speaking, 339, *chart.*

Finns, racial history placed, 125; distribution in Iron Age, 176–77, *chart;* compared with Scyths, 197; Slavic invasion, 217; language, 236; racial characteristics of Finns as whole, 254, 257, 261, 265, 268, 278, **337–59;** language distribution in Europe, 338; language stock, 339, *chart;* in Deniker's system, 283; mixture with Samoyeds, 307; influence on E. Norwegians, 313; influence in Sweden, 328; racial study of E., **342–51;** racial study of Baltic, **351–59;** Livs compared with true, 353; racial study of, in Finland, **355–59;** compared with Great Russians, 575–76; element in Mongoloid Russia, 578; Borreby types, *ill.*, Plate 5, *fig.* 5; East Baltic type, *ill.*, Plate 7, *fig.* 5; Upper Palaeolithic survival, *ill.*, Plate 9, *fig.* 4; Corded, *ill.*, Plate 27, *fig.* 1; Dinaric, *ill.*, Plate 35, *fig.* 4. *See also* Finno-Ugrians.

Fis, defined and described, 595–97.

Fjelkinge cranium, *ill.*, 54, *fig.* 12.

Flanders: *see* Flemings.

Flemings, language distribution, 512; racial characteristics, 519, 523, 524–25, 526–29; Nordic blend, *ill.*, Plate 34, *fig.* 2.

Food Vessel peoples, movements in Bronze Age, 132–33, *chart;* described, **160–61;** in Ireland, 161–62; routes of invasion, 162; in British Isles, 371.

France, Magdalenian skulls in, 47; Mesolithic man in, **64–66;** Danubian settlers in, 104; Neolithic in, 115–18; Bronze Age in, 165–66; Kelts in, 187; invasion by Goths, Gepidae, Vandals, 205; Franks in, 206, 214–15; invasion by Huns, 228; Norwegian migration to, 308; migration of Jews to, 437; Basques in, 501–04; Gypsies in, 505, 506–07. *See also* Frenchmen.

Franche Comté crania, described, 165.

Franks, origin, 206; in Belgium, 524, 525; in Netherlands, 529; in Germany, 537.

French language, in Switzerland, 548.

Frenchmen, racial characteristics, 255, 257, 260, 264, 265, 266, **511–22;** thralls in Sweden, 327; immigrants to

British Isles, 374; Alpine, *ill.*, Plate 12, *fig.* 2; *ill.*, Plate 13, *figs.* 2, 3; Atlanto-Mediterranean, *ill.*, Plate 23, *fig.* 2; Nordic blend, *ill.*, Plate 34, *fig.* 4; Dinaric, *ill.*, Plate 36, *fig.* 3. *See also* France.
Frisians, origin, 206; crania compared with Hannover, 207; placed, 332; in Sweden, 328; in Belgium 524; racial characteristics, **529–35.**
Friterpia crania, described, 531.
Fulah, identified, 474.
Fundul Moldovii Vlachs, racial characteristics, 616.
Fünen, dolichocephaly in, 123.

Gaelic, distribution, 372, 373.
Gaguz, in Rumania, 612.
Galatian colony, Keltic, 187.
Galicia, outpost of Kelts, 186; Jews in, 642.
Gallas, head size, 266; racial characteristics, 445, 447, 448, **449–57**; *ill.*, Plate 20, *fig.* 4.
Galley Hill man, described, **21–22**; compared with Skhul, 27, with Upper Palaeolithic, 31, with Grimaldi, 33, 34, with Combe Cappele, 34, with Crô-Magnon, 36, with Afalou #28, 40, with Gamble's Cave, 44, with Elmenteitan, 57, with al 'Ubaid, 87, with Kilgreany, 112; height, 32; *ill.*, 52, *fig.* 4; as ancestor of Mediterranean group, 83; relation to S. Russian Neolithic, 104; in racial classification, 290, *chart;* placed, 370.
Gamble's Cave crania, described, **44–46.**
Gauls, described, **190–91**; crania compared with Roman, 194; in Belgium, 523. *See also* Kelts.
Gemeinlebarn crania, described, 163.
Genkingen Germans, racial characteristics, **544–45.**
Geography, Mesolithic, 71, and 71 *map* 1; Mesolithic, 72; Egypt, 92; Norway, 308; Sweden, 326, 329; Denmark, 334; Arabia, 401; Yemen, 402; and stature, in France, 514–15; Belgium, 523; Netherlands, 530; Switzerland, 547–48; Poland, 563.
Georgians, language, origin, 175; distribution, 631, *map;* racial characteristics, **633–34.**
Gepidae, speech, 205; crania, 206; conversion to Christianity, 214; migrations, 536.
Germanics, distribution in Iron Age, 176–77, *chart;* speech classified, 179; expansion in Iron Age, 181; crania compared to Finns, 225; in Portugal, 495; in France, 512; language, Flemish, 524; element in Netherlands, 529.
Germans, racial characteristics, 254, 260, 264, 265, **535–47**; in Sweden, 328; influence in Baltic, 361; and Lithuanians, 365; language in France, 512; in Switzerland, 548; in pre-Munich Czechoslovakia, 559; in Crimea, 582; in Rumania, 612; Neo-Danubian, *ill.*, Plate 31, *fig.* 3; Upper Palaeolithic Nordic, *ill.*, Plate 33, *fig.* 3; Alpines, *ill.*, Plate 11, *figs.* 1–4; Dinaric, *ill.*, Plate 35, *figs.* 1, 2; Borreby type, *ill.*, Plate 6, *figs.* 1–3.
Germany, effect of early migrations, 8; glaciation and, 19; Magdalenian crania in, 47; Mesolithic period in, 73–74; as route of Neolithic, 101; Corded people in, 109; brachycephaly in Neolithic, 124; Bell Beaker in, 156; Food Vessel prototypes, 162; Hallstatt culture in, 182, 183–84; Kelts in, 186, 188–89; Germanic peoples in, 202; invasion by Slavs, 217; Slavs in, 218–19; invasion by Huns, 228; Jews in, 437, 642; Gypsies in, 505; E., language distribution, 561, *map.*
Gerrhi, Land of the, described, 197.
Ghegs, identified, 595; racial characteristics, **595–602**; Nordic, *ill.*, Plate 30, *fig.* 3; Dinaric, *ill.*, Plate 39, *figs.* 2, 4, 5.
Ghomara, invasion and origin, 463, 465; language, 467; distribution, 480; racial characteristics, **483.**
Ghuzz: *see* Seljuks.
Gibraltar, as highway of Mesolithic influences, 69; Neolithic invasion by way of, 82.
Glaciers, effects and extent of, 19–20, 56, 69; retreat to Scandinavia, effects of, 78.
Glasgow crania, described, 375–76.
Glasinac crania, described, 184–85, 190.
Glossary, 666–83.
Gloucester, Roman burial, 195.
Goidelic: *see* Q-Keltic.
Goidels, in Ireland, 371, 372.
Gold, early use of, 134; as medium of exchange, 166.
Gorals, identified, 571.
Goths, ousting of Sarmatians, 197; speech, 205; invasions by, 205; crania, 206;

origin, 327; in Spain, 490; migrations, 536; in Crimea, 582; in Dacia, 613.
Gotland, Corded skull, 55, *fig.* 15.
Great Russians, racial study of, **572–76.**
Greece, Neolithic, 82, 101; influence in Bronze Age Spain, 148; cremation introduced, 171; Keltic invasion, 187; invasion by Goths, 205; language distribution, 561, *map;* Osmanli Turks in, 617.
Greeks, study through politics and language, 174; Iron Age language group, 175; influence on Kelts, 187; sculpture of Kelts, 190; influence on Scythian art, 198–99; religion compared with Norse, 202; racial classification by, 279; migration of Jews among, 436; in Egypt, 458; in Corsica, 499; in France, 512; in Sicily, 554; in Crimea, 582; racial characteristics, **604–09;** in Bulgaria, 610; Vlachs in, 614; in Turkey, 618; in Asia Minor, compared with Turks, 619; in Cyprus, 624; Dinaric, *ill.*, Plate 39, *fig.* 6; *ill* , Plate 14, *fig.* 5.
Greenland Eskimos, crania, 30.
Greenlanders, decrease in stature, 10.
Grimaldi skeletons, described, **33–34;** compared with Afalou #28, 40, with Gamble's Cave, 44, with Asselar man, 60; in racial classification, 290, *chart.*
Groningen people, described, 531.
Groterpia crania, described, 531.
Guanche, crania, compared with Crô-Magnon, 285; identified, 462; racial characteristics, **484–86.**
Gudea, King, described, 90; *ill.*, 89, *fig.* 18.
Guipuzcoa skeletons, described, 152.
Guraghes, language, 447.
Gypsies, racial characteristics, **504–07;** in Rumania, 612; in Turkestan, 635; *ill.*, Plate 19, *figs.* 1, 2.
Gzennaya, identified, 480.

Haddendoa, described, 457.
Hadhramauti, head size, 266; described, **402–03;** missionaries, 427; racial characteristics, **427–30;** and Judaism, 438; in Ethiopia, 447; compared with Hamites, 452; *ill.*, Plate 19, *fig.* 5; Dinaric, *ill.*, Plate 43, *fig.* 3.
Hagias Kosmas crania, described, 144.
Hagios Nikolas, people described, 142.
Hainburg-Teichtal site, placed, 163.
Hair color: *see* Pigmentation.
Hair form, Assyrian, 90–91; classified, 277–78; in Deniker's system, 280–83; Lapps, 302–03; Norway, 311, 317; Icelandics, 324; Mordvin Cheremisses, 347; Votiaks, 348; Livs, 353; Letts, 363–64, 365, 367; Livs and Kurs, 364; Lithuanian, 366–67; Irish, 380; Great Britain, 393; Yemenis, 404–05; Hejaz, 409; Mesopotamians, 412; Kuwaitis, 414; Afghans and Pathans, 420; Dardic speakers, 421; Turkomans, 423; Veddoid and Negroid, 426; Hadhramauti, 428, 429; Baluchis and Brahui, 431; E. African Hamites, 453–54, 456–57; modern Egyptians, 460; Siwans and Awjila people, 469; Arabo-Berbers, 470; Mzabites, 475; Kabyles, 478; Riffians, 482; Spaniards, 492; Andalusians, 493; Gypsies, 506; Mediterraneans as whole, 508; French, 521; Italians, 557, 558; Poles, 566–67; White Russians, 568; Great Russians, 574, 575, 576; Kirghiz, 580–81; Kalmucks, 583; Montenegrins, 593; Albanian Ghegs, 599; Osmanli Turks, 620; Armenians, 628; Turkestan Jews, 640; Ashkenazim Jews, 645–46.
Hallstatt culture, language, 181; described, **182–85;** compared with "Danes' Grave," 192, with Scyths, 199, with Visigoths, 206, with Thuringians, 212–13; in Norway, 309–10; predominance, in Sweden, 329; in Germany, 536; in Tyrol, 552; in Italy, 554.
Hämäläiset, identified, 356.
Hamburg culture, and Magdalenian, 70.
Hamites, modern African, described, 45; intermingling with Bushmen, 59; stature, 255; dolichocephaly among, 257; head size, 265–66; compared with Tuareg, 473.
Hamitic, linguistic stock, 178, 445; in Deniker's system, 281; in N. Africa, 462.
Hannover crania, described, 207; compared with Thuringians, 212, with Iron Age Polish Slavs, 218.
Haratin, identified, 466.
Has, classified, 595; distribution, 596, *map;* racial characteristics, 598.
Hastière crania, described, 118.
Hausa, identified, 474.
Haute Savoie crania, placed, 191.
Hazara, identified, 417.
Head measurements: *see* Cranial measurements.
Head size, in modern Europe, discussed, **261–67;** *map*, 262–63; relation to face

size, 267. *See also* Cranial measurements.
Heidelbergensis, as *non-sapiens*, 23; jaw, 25.
Height: *see* Stature.
Hejaz people, placed, 401–02; racial characteristics, **409–10**; Jews in, 438.
Hellenes, areas occupied by, in Iron Age, 176–77, *chart*. *See also* Greeks.
Hellenic speech, classified, 179.
Helvetii, identified, 189, 536.
Herzegovinians, classified, 587.
Hessians, origin, 206, 212; identified, 537.
High German, classified, 524.
Himalayas, glaciation and, 19; language in Iron Age, 175.
Hindus, in Turkestan, 635.
Hissarlik crania, placed, 136.
Hittites, Bronze Age crania, 136; *ill.*, 137, *fig.* 26; language blended with Našili, 180; influence on Jewish facial characteristics, 439; relation to Armenians, 625.
Hiung-Nu people, described, **227**; relation to Huns, 227, 232; relation to Turks, 228; horse culture, 238–39.
Hojeri, described, 426.
Holland, glaciation and, 19; origin of Scots Bell Beaker, 160; route of Food Vessel invasion, 162; Germanic expansion in, 181; dolichocephaly in, 257; migration of Jews to, 437. *See also* Netherlanders.
Homo neanderthalensis: see Neanderthal man.
Homo sapiens, Pleistocene origin, 1–3; introduction to study of, **16–18**; in fourth ice age, 20; in Middle Pleistocene, **20–23**; Negro as, 34; Neanderthaloid stock and, 38; compared with Afalou, 42; in China and Mongolia, 49–50; evolution of, 50–51; early, *ill.*, 52, *figs.* 4, 5, 6; Mediterranean as, 83; Neolithic, 127; pigmentation, 273.
Hottentots, relation to Asselar man, 61. *See also* Bushmen.
Howeitat, placed, 401.
Hungarians: *see* Magyars.
Hungary, center of Metal Age diffusion, 155; Bell Beaker in, 156; Gepidae invasion, 205; movement of Magyars to, 224; Huns in, 228; Avars in, 228, 232; head size, 265, 266; language, 338; Ugri in, 341; Gypsies in, 506. *See also* Magyars.
Huns, Bronze Age migrations, 135; compared with Scyths, 196; destruction of Alans, 197; absorption of Goths, 205; Mongoloid element, 213; appearance in Russia, 227; racial characteristics, 228, **229–33**; relation to Avars, 231; in Volga region, 341; in Spain, 490; migrations, 577; in Crimea, 582.
Hunza, *ill.*, Plate 15, *fig.* 6.
Huzuls, racial characteristics, 571, 572.
Hvellinge #1, *ill.*, 54, *fig.* 11.
Hyksos, migrations, 135.
Hythe crania, described, 374, 375.

Iberian center, Bronze Age, 132–33, *chart*.
Iberian peninsular: *see* Portugal, Spain.
Ibero-Insular, in Deniker's system, 281, 282; in Czekanowski's system, 288.
Ibiza cranium, placed, 153.
Iceland, decrease in stature in, 10; modification in masticatory muscles, 29; racial characteristics, 265, 273, **323–26**; Norwegian migration to, 308; Borreby type, *ill.*, Plate 5, *fig.* 4.
Igdir, racial characteristics, 424.
Ijores, language classified, 338; placed, 340; racial characteristics, **345**.
Ilium, placed, 137.
Illyrians, distribution, in Iron Age, 176–77, *chart;* speech, 179, 181; speakers discussed, **182–86**; relation to Kelts, 187, 188; in Italy, 195, 554; and Slovenes, 587; in Yugoslavia, 588.
India, movement of Aryan ancestors into, 86; religion compared with Iron Age Norse, 202; invasion by Huns, 228; Iranians in, 238; Jews in, 438; Gypsy origin and, 504; Assyrians in, 630.
Indic, speech classified, 179.
Indo-Afghan, in Deniker's system, 281, 282.
Indo-European speech, stock, 178; discussed, **178–82**; in Caucasus, distribution, 631, *map*.
Indo-Iranian, relation to Keltic, 188; Slavic language and, 216.
Ingrians, language distribution, 338; language stock, 339, *chart;* racial characteristics, **345**.
Iranian speech, classified, 179; Scyths as users, 196; distribution, 416, *map*.
Iranians, invasion into Iran, 86–87; and Persian Empire, 180; migrations, 227, 238; racial characteristics, 415, 416, **418–19**; in Turkestan, 634; Dinaric, *ill.*, Plate 43, *fig.* 5; Turkestan, *ill.*, Plate 15, *fig.* 4.

Irano-Afghans, classified, 289, 290, 292; geographic distribution, 294–95, *map;* element in Mesopotamians, 412–13; racial characteristics, **415–22;** Turkomans as, 423–24; Azerbaijanis as, 425; element in Armenoids, 629; *ill.*, Plate 18, *figs.* 1–8.
Iraq, stature in, 255; racial study of peoples in, **411–15;** migration of Jews to, 435; *ill.*, Plate 16, *fig.* 6.
Ireland, effect of emigration on, 8; Upper Palaeolithic implements, 57; Bronze Age in, 161–62; Q-Keltic in, 187; Kelts in, 191; Danes in, 211. *See also* British Isles.
Irish, racial characteristics, 261, 264–65, 268, 273, 276, 277, 326, 371, 372, **376–84;** in Deniker's system, 283; in Iceland, 323, 324; Upper Palaeolithic survivals, *ill.*, Plate 9, *figs.* 1–7; *ill.*, Plate 24, *fig.* 3.
Iron Age, discussed, **174–240;** races and language, 174–82; Kelts, 186–93; Illyrians, 182–86; Romans, 193–95; Scythians, 195–201; Germanic peoples, 201–16; Slavs, 216–20; Turks and Mongols in, 227–36; in Norway, 308; in British Isles, 371–72; in France, 512; in Netherlands, 530; in Germany, 536.
Isle of Man, Q-Keltic, 187.
Isnello crania, described, 147.
Istria crania, described, 148.
Istrian Vlachs, racial characteristics, 616–17.
Italians, racial characteristics, 257, 260, 269, 272, **554–59;** in France, 512; language in Switzerland, 548; element in Dalmatians, 591; N. Borreby type, *ill.*, Plate 6, *fig.* 5; Neapolitan, *ill.*, Plate 22, *fig.* 2; Piedmontese, *ill.*, Plate 23, *fig.* 1; Dinaric, *ill.*, Plate 37, *figs.* 2, 3.
Italic speech, classified, 179; in Italy, 181; relation to Keltic, 186; in British Isles, 372.
Italici, distribution in Iron Age, 176–77, *chart;* described, **193–95;** arrival in Italy, 554.
Italy, as avenue of entry for Mesolithic, 69; as route of Neolithic, 101; Bronze Age in, 146, 147–48; appearance of Etruscans, 153–54; Urnfields invasion, 171; Ligurian in, 180; Villanova people in, 181; Hallstatt culture in, 182; Keltic expansion into, 187; Italici in, 193–95; Illyrians in, 195; invasion by Cimbri and Teutons, 202; invasion by Goths, 205; migration of Jews to, 437.
Jaeren crania, placed, 204–05.
Japanese, selection among emigrants, 8.
"Japhetic," defined, 175.
Java man, separation from *homo sapiens*, 1.
Jeballis, distribution, 480; racial characteristics, 483–84.
Jebel Druz, pigmentation, 272.
Jemdet Nasr culture, placed, 87.
Jerbans: *see* Kharejites.
Jews, history and racial study of E., **432–44;** *ill.*, 433, *figs.* 33–36; *ill.*, 434, *fig.* 37; oriental, described, 438–44; Yemenite, 439–41; Mesopotamian, 442–43; Sephardic, 443; in Egypt, 458; in Spain, 490–91; in France, 512; in Czechoslovakia, 559; in Poland, 563; in Crimea, 582; in Rumania, 612–13; in Turkey, 618; in Caucasus, 631; in Turkestan, 635; racial study in Asia and central Europe, **638–46;** *ill.*, Plate 44, *figs.* 1–4, Plate 45, *figs.* 1–4, Plate 46, *figs.* 1–7; Berber-speaking, *ill.*, Plate 44, *fig.* 4; Morocco, *ill.*, Plate 44, *figs.* 2, 3; Yemenitic, *ill.*, Plate 44, *fig.* 1.
Jmouds, identified, 365; hair form, 367.
Jutas crania, described, 232.
Jutes, described, 209–10; origin, 333; in British Isles, 372.
Jutland, dolichocephaly in, 123.

Kabardine, distribution, 631, *map;* racial characteristics, **633.**
Kabyles, language, 467; distribution, 476; racial characteristics, **477–79;** compared with Canarians, 488; *ill.*, Plate 21, *fig.* 4; Nordic, *ill.*, Plate 30, *fig.* 6.
Kafirs, placed, 417; racial characteristics, **420.**
Kainsulaiset: *see* Kvaens.
Kalmucks, appearance in Russia, 577; racial characteristics, **583;** distribution, 631, *map;* in Turkestan, 635.
Kammkeramik culture, people described, 351; placed, 360; in Poland, 564.
Kanam, mandible described, 22; in racial classification, 290, *chart.*
Kanjera crania, described, **22–23;** compared with Gamble's Cave, 44; in racial classification, 290, *chart.*
Kansu, painted pottery, 105.
Kara Kalpaks, identified, 635.
Karagas, identified, 306.
Karaite Jews, racial characteristics, **641,** 642.
Karduchoi, identified, 421.

Kashgaria, survival of Iranian language, 198; Iranians in, 227.
Kassimov Tatars, described, 582.
Kaufertsberg cranium, described, 66, 67; tooth knocking in, 68.
Kebara skeletons, described, 62.
Keltic speech, classified, 179.
Kelts, distribution in Iron Age, 176–77, *chart;* expansion in Iron Age, 181; discussed, **186–93;** compared with Scyths, 199, with Iron Age Danes, 203, with Anglo-Saxons, 209, with Bajuvars, 212, with Alemanni, 212, with Franks, 214–15, with Wends, 219; classified, 292–93; in Iceland, 324; invasion of British Isles, 371–72; in Ireland, 377, 383; probable physical appearance, 384; importance in Great Britian, 384, 399; pigmentation, 389; in Spain, 490; in Portugal, 495; in France, 512, 519; in Belgium, 524; in Germany, 536; in Italy, 554; and Slovenes, 587.
Kenya, stature, 255; crania described, 445.
Keuperfranken, racial characteristics, **542–43.**
Kharejites, compared with Canarians, 488.
Khargans, racial characteristics, **46–62;** *ill.*, Plate 21, *fig.* 1.
Khazars, relation to Jews, 436; in Crimea, 582.
Khoi-San: *see* Bushmen.
Kiel Harbor crania, described, 74; placed, 123.
Kiev Government, crania, 136, 200; breaking up of Kazars, 436; Ukrainians in, 571.
Kilgreany cranium, placed, 112.
Kipchaks, identified, 635.
Kirghiz, origin, 239; relation to Turkomans, 424; racial characteristics, **579–82;** distribution, 631, *map.*
Kirkuk crania, placed, 88.
Kish crania, described, 86, 88.
Kizilbashes, identified, 618.
Knossus, frescoes, 142.
Kokui cranium, described, 126.
Koreans, classified, 237.
Kremlin crania, described, 573.
Krimchaks, racial characteristics, **641.**
Kumans, placed, 229; in Hungary and Russia, 234; element in Magyars, 584.
Kupinovo cranium, placed, 190.
Kurdistan, Jews in, 641.
Kurds, racial characteristics, 255, 264, **421–22;** in Iran, 416; in Rumania, 612; distribution, 631, *map; ill.*, Plate 18, *fig.* 2.
Kurgans, Neolithic remains described, 102–03; compared with Danubian, 106.
Kurland, Letts in, 340; Baltic Finns in, 351.
Kurs, speech, 360; pigmentation, 363; described, **365.**
Kuwaitis, racial characteristics, **413–14.**
Kvaens, identified, 301; element in Norway, 319–20, in Sweden, 328; speech and racial characteristics, **356, 357.**
Kymric, in Great Britain, 371; distribution, 373; crania described, 376; in Wales, 387.

Laaland, brachycephaly in, 123.
La Chapelle aux Saints, man reconstructed, *ill.*, 35; cranial measurements, 37; cranium, *ill.*, 53, *fig.* 7.
Ladin dialect, origin, 213; distribution, 548; in Tyrol, 552.
Ladino, origin, 437.
Ladogan, crania described, 125–26, 360; Mesolithic survivals, 226; classified, 289, 290; survivors in Europe, **291–92;** element in Poland, 564, 566, 567, in White Russians, 568, in Ukrainians, 570; type, *ill.*, Plate 2, *figs.* 1–4.
Lake Dwelling culture, movements traced, 80–81, *map* 2; described, 113–15.
Landnambok, described, 323, 324.
Langeland, dolichocephaly in, 123.
Language, as foundation of study of race, **174–82;** Indo-European, **178–82;** Keltic, 186; Italic, 193; Germanic, 203, 205; Frankish, 214; of Slavs, 216; Finno-Ugrian, 223, 337–39; Turks, 228–29; Magyars, 233; Uralic and Altaic-speakers, **236–40;** European distribution of, 338, *map;* Lapps, 300; Samoyed, 306; Finnish in Sweden, 328; Bulgarians, 341; Votiak, 347; Letts and Lithuanians, 360–61; Scotland, 372; Wales, 373, 387, 399; Cornwall, 373; Aran Isles, 379; Gaelic, 387; Mediterraneans in Arabia, 403; Iranian and sub-groups, 416; Kafirs, 417; Baluchis and Brahui, 430–31; Khazars, 436; Ladino and Yiddish, 437; Agau, 438; Hamitic and Semitic in E. Africa, 445; E. African Hamitic area, 446, *map;* Coptic, 458; in N. Africa, 462–63, 467;

Ghomara and Senhaja Sghir, 483; Sassari, 500; Sardinia, 500; Basques, 501–02; Gypsy, 504–05; in France, 512; Cornish in Brittany, 514; Flemish, 524; Netherlands, 529–30; Frisian, 529–30, 533; spread of German, 537; Switzerland, 548; Austria, 550; distribution in E.-central Europe and Balkans, 561, *map;* Ruthenians, 571; Altaic speakers in Russia, 577; Bashkirs and Meshcheryaks, 578; Magyar, 584; Albanian, 597; Serbs, 609; in Dacia, 613; Vlachs, 613; Assyrians, 630; Caucasians, 631; Karaite Jews, 641.

Langue d'Oc, in France, 512.

Lappanoid, in Czekanowski's system, 288, 289.

Lappish, classified, 292; geographic distribution, 294–95, *map.*

Lapps, classified, 223, 289, 290; racial characteristics, 261, 266, 269, **298–306;** in Deniker's system, 281; in von Eickstedt's system, 287, 289; in Czekanowski's system, 289; element in Norway, 319–20; language distribution in Europe, 338, *map; ill.,* Plate 1, *figs.* 1–6.

La Tène culture, in central Europe, 181; compared with Hallstatt, 187; Bohemia, 189; in France, 190; crania compared with Roman, 194.

Latin language, classified, 193; in France, 214, 512; in Walloon country, 524.

Latvia, Mesolithic survivals, 226; Baltic Finns in, 340, 351; Livs in, 352.

Latvians: *see* Letts.

Laugerie Basse cranium, as Crô-Magnon, **48–49.**

Lausitz culture, described, 188.

Lautsch cranium, described, 36.

Lebanese, racial characteristics, 261, **623–24;** Dinaric, *ill.,* Plate 41, *fig.* 2.

Leg length: *see* Body form.

Le Moustier cranium, measurements, 37.

Lenja people, racial characteristics, **414–15.**

Le Placard cranium, as Crô-Magnon, 49.

Lesghians, distribution, 631, *map.*

Letgali: *see* Letts.

Letts, racial characteristics, 257, **360–66;** influence on Lapps, 300; migration, 340. *See also* Latvia.

Levalloiso-Mousterian, crania, *ill.,* 53, *figs.* 7, 8.

L'Homme Mort crania, described, 116.

Libico Berber language, classified, 445.

Libyans, ancient, described, 464; *ill.,* 464, *fig.* 38; racial characteristics, **468–71.**

Ligurians, crania described, 101; distribution in Iron Age, 176–77, *chart;* speech classified, 179; as Indo-European, 180; placed, 195.

Lincoln, Roman burials in, 195.

Lithuania, language distribution, 561, *map;* Jews in, 642.

Lithuanians, influence on Lapps, 300; racial characteristics, 360–61; **365–68;** Tatars, study of, 367–68; in Poland, 563; compared with White Russians, 568; *ill.,* Plate 7, *fig.* 3; Plate 28, *fig.* 4.

Litorina Sea, formation of, 63; Ertebølle culture on, 72.

Littoral European, in Deniker's system, 281, 282; in Czekanowski's system, 288.

Livonia, Letts in, 340; Baltic Finns in, 351.

Livs, language distribution in Europe, 338, *map;* language stock, 339, *chart;* racial characteristics, **352–53;** compared with Esths, 354.

Lombards, described, 213.

Long Barrow men, cranium, *ill.,* 55, *fig.* 14; described, 110–13; compared with French Neolithic, 116; relation to Danish Neolithic, 122; compared with Bronze Age Trojans, 137, with Bell Beaker, 158; survival in Wales, 397; survival, *ill.,* Plate 23, *fig.* 3.

Long-heads: *see* Dolichocephaly.

Lorraine crania, placed, 191.

Los Millares culture, in Copper Age Spain, 148.

Low German, classified, 524.

Lower Austria, racial characteristics, **551–52.**

Lozère crania, described, 116.

Luma, classified, 595; distribution, 596, *map;* racial characteristics, 597.

Lur, *ill.,* Plate 18, *fig.* 1.

Luristan crania, described, 86–87; pigmentation, 272.

Luxemburg, racial study of, 527.

Lydia, Etruscan homeland, 154; language, placed, 175.

Lyds: *see* Ijores.

"Lyngby" antler axe, appearance of, 71; culture, Maglemose derived from, 72.

MacArthur cave crania, described, 75; compared with Iron Age Norwegians, 204; placed, 370.

Macedonia, route of Neolithic into, 101; Serbs in, 589; Vlachs in, 614; Osmanli Turks in, 622.
Macedonian Vlachs, racial characteristics, 616.
Magdalenians culture, described, **46–48**; crania described, **47–49**; survival into Mesolithic, 57, 65; compared with Teviec, 65, with Lapps, 298.
Magiabra people, racial characteristics, **469–70**.
Maglemose culture, derivations, 71–72; and Ertebølle, 72; skeletal finds, **72–74**; in Scotland, 75; compared with Neolithic forest dwellers, 125.
Magyars, origin, 223, 341; entry into Hungary, 224; early, described, 233–34; language distribution in Europe, 338, *map;* Bolgars and, 341; relationship to Ostiaks and Voguls, 350; number in Czechoslovakia, 559; racial characteristics, **584–86**; in Yugoslavia, 587; in Rumania, 612; *ill.*, Plate 2, *fig.* 1; *ill.*, Plate 14, *fig.* 1; Dinaric, *ill.*, Plate 37, *fig.* 4.
Mahra, language, 403; Veddoids among, 425–26; racial characteristics, 427.
Maklacheievka crania, placed, 224.
Malay, influence among Yemenis, 408; in Hadhramaut, 427.
Mallorca, Bronze Age in, 152.
Malsia ë Madhë, identified, 595; distribution, 596, *map;* racial characteristics, 597, 598, 599, 600; *ill.*, Plate 39, *fig.* 3, Plate 8, *figs.* 4, 6.
Malsia Jakovës, classified, 595; distribution, 596, *map;* racial characteristics, 597, 599, 600, 601.
Malta, Bronze Age in, 147.
Marabutic tribes, racial characteristics, 470.
Mariupol, Neolithic remains, 103; compared with Alishar, 136.
Mas d'Azil remains, described, 66.
Masai, compared with Oldoway, 45.
Mashausha, described, 464.
Masmuda: *see* Ghomara.
Massagetae, placed, 196.
Mati, classified, 595; distribution, 596, *map;* racial characteristics, 597.
Maualy, identified, 623.
Maxyces: *see* Mashausha.
Measurements, cranial: *see* Cranial measurements.
Measurements, nasal: *see* Facial characteristics.
Mechta el 'Arbi crania, described, 59–60.
Mediterranean race, basic stock described, 2–3; origins, 46; in post-glacial period, 57; mixture with African Mesolithic man, 60; Natufians basic type of, 62; and Neolithic, 82–86, 98, 100, 104, 114, 116, 118, 127; defined, 83; characteristics outlined, 84; relation to Fayum, 94; in N. forests, 126; in Copper and Bronze Age, 139, 141, 142, 144, **146–52**; languages in Iron Age, 175; distribution in Iron Age, 176–77, *chart;* compared with early Finns, 225; Finno-Ugrians as, 226; racial characteristics, 254, 255, 257, 268, 278; in Deniker's classification, 281, 283; in Ripley's classification, 284; in von Eickstedt's system, 287; classified, 289, 290, 292, 293; geographic distribution, 294–95, *map;* survival in Great Britain, 384, 398, 399; element in Scotland, 388; racial study as whole, **400–509**; significance, 511; element in France, 521, 522; in Germany, 535, in Switzerland, 549, in Italy, 554–59, in Poland, 567, in White Russians, 568, in Great Russians, 576, in Dinarics, 601, in Bulgarians, 611, in Osmanli Turks, 619, 621, in Syrian Bedawin, 623, in Lebanese, 624, in Armenoids, 629, in Assyrians, 630, in Ossetes, 632, in Tajiks, 638, in Turkestan Jews, 640, in Ashkenazim, 645; results of Alpine blend with, 647; expansion and survival, 650–52; in Arabia, *ill.*, Plate 16, *figs.* 1–6; long-faced Western Asiatic Highlands, *ill.*, Plate 17, *figs.* 1–5; Irano-Afghans, *ill.*, Plate 18, *figs.* 1–8; dark-skinned, *ill.*, Plate 19, *figs.* 2, 3; N. Africa, *ill.*, Plate 21, *figs.* 1–6; S. Europe, *ill.*, Plate 22, *figs.* 1–4; in Great Britain, *ill.*, Plate 25, *figs.* 1–4; Pontic, *ill.*, Plate 26, *figs.* 1–4.
Megalithic culture, movements traced, 80–81, *map* 2, 128; characteristics, 85; in N. Africa, 99; as bringers of Neolithic to British Isles, 110; in Scandinavia, 122–23; in Copper Age Sicily, 147; relation to Copper Age Spanish crania, 149; among Basques, 152; in Scots Bronze Age, 160; distribution in Iron Age, 176–77, *chart;* stature survival, 254; invasions of Sweden, 327; concentration in Denmark, 335; in British Isles, 371, 377, 383, 397; pigmentation, 384; in Spain, 490; in France, 511.

Megiddo crania, described, 137–38.
Melilla cranium, placed, 153.
Mendelism, as applied to man, 4–6.
Mendonck, racial study of people of, 528.
Menes, and dynastic tradition, 95; placed, 141.
Menghin, movements traced, 80–81, *map* 2.
Merians, language stock, 339, *chart;* placed, 340.
Merimdians, culture placed, 93; compared with Badarians, 94; with N. Africans, 99, with Danubians, 105, with Windmill Hill, 110.
Merovingian Franks, described, 215.
Meshcheryaks, classified, 577; racial characteristics, **578.**
Mesocephaly: *see* Cephalic index, Cranial measurements.
Mesolithic period, crania in, 14, *ill.*, 52, *fig.* 6, 54, *fig.* 11, 55, *fig.* 13; discussed, **56–77;** geography of N. W. Europe, 71, *map* 6; compared with Neolithic, 127; survival in far north, 226; survivors in Europe, 291; in British Isles, 379–80; remains in Africa, 445, 467; survival in France, 518.
Mesopotamia, Neolithic remains in, 87–91; facial types, *ill.*, 89, *figs.* 17–20; use of metal, 131–32; invasion by Huns, 228; racial study of Arabic-speaking peoples, **411–13;** Jews in, 438, 442–43. *See also* Sumeria.
Metalsa, identified, 480.
Michelsberg culture, identified, 535.
Microlithic tools, introduction of, 56.
Miesbachers, racial characteristics, 545.
Migrations, as selective factor, 7–9; Bronze Age, 135, 152, 154, 170–71, 221; Iron Age, 181; Keltic, 187, 371–72; Germanic, 202, 327, 536–37; Frankish, 214; Slavic, 217; Finnish, 217, 224, 328; Danubian, 221; Iranians, 227, 238; Turks and Mongols, 228–29; Magyar to Hungary, 233; Finno-Ugrian, 236; Viking, 323; Danish, 333; Baltic, 360; Jewish, 435–47; Berber, 463; Arab, in N. Africa, 466–67; Gypsies, 504; in Balkans, 589; Vlach, 614; Turkish nomads, 618.
Milesians, identified, 372.
Minoans, crania described, 141; in Bronze Age Greece, 144; art compared with Greek, 146.
Minorca crania, described, 149; Bronze Age in, 152.
Minussinsk crania, described, **169–70;** compared with Scyths, 199, with Finnish, 225, with non-Mongoloid Avars, 232; relation to Finno-Ugrians, 236.
Mirdita, classified, 595; distribution, 596, *map.*
Mitwali, racial characteristics, 623.
Moabites, identified, 434.
Mohmands, identified, 417; *ill.*, Plate 18, *fig.* 4.
Moldavians, racial characteristics, 261, **612–13.**
Mongoloid, derivation of, 2; as race, 5; Neolithic, in N. forests, 126; Scythians as, 196; and Germanic type, 213; features, 278; in Deniker's system, 281; classified, 290–91; geographic distribution, 294–95, *map;* element in Lapps, 298, 300, 305, in Samoyeds, 306–07, in Carelians, 344, in Mordvins and Cheremisses, 347, in Ostiaks and Voguls, 350, in Lithuania, 361–62, in Turkomans, 424, in Hadhramaut, 427, in France, 522, in Russians, 572, 573, 575, in Magyars, 586, in Turks, 620–21, in Tajiks, 638; *ill.*, Plate 3, *figs.* 1–6.
Mongols, Bronze Age migrations, 135; living habits compared with Scyths, 196–97; in Iron Age, 227; discussed, **227–36;** language, 236; classified, 237; language distribution in Europe, 338, *map;* in Babylon, 435; in Russia, 572; of European Russia, racial study of, 576–84; in Turkestan, 634.
Montardit skeletons, described, 66.
Montenegrins, classified, 587; racial characteristics, 266, 279, **591–95;** *ill.*, Plate 8, *figs.* 2, 3; Dinaric, *ill.*, Plate 38, *fig.* 4.
Montenegro, Illyrians in, 185; Slavic invasion, 217; Ghegs in, 598.
Moorfields crania, described, 375.
Moors, in Spain, 490–91; racial characteristics, **494–95.**
Moravia, Neolithic invasions, 82, 101; Danubian settlers in, 104; Bronze Age in, 162.
Mordvins, crania classified, 225; language distribution in Europe, 338, *map;* language stock, 339, *chart;* placed, 340; Bolgars and, 341; racial characteristics, 342, **345–47;** compared with Great Russians, 575, with Chuvash, 577.
Morocco, racial study of, **480–84.**
Mount of Olives crania, placed, 138.

Mousterians, described, **26–28**; culture, 39.
Muge skeletons, described, **63–64**; cranium, *ill.*, 55, *fig.* 13; compared with Radeyef and Tibessa, 98, with Algerians, 99, with Chamblandes, 115; element in Portugal, 498; survival in Italy, 558.
Mullerp finds, described, 73.
Mummification, as basis of study of soft parts, 85.
Muroma, language stock, 339, *chart;* placed, 340.
Murzak Koba skeletons, described, 68–69; compared with Zizernakaberd, 102.
Mycenae crania, described, 144.
Mythology, Norse, as aid to racial study, 321–22.
Mzabites, language, 467; racial characteristics, **475**.

Naqada people, described, **95–96**; compared with Ticuso, 100, with Minoan, 141.
Narbonne cranium, described, 149.
Nasal index: *see* Facial characteristics.
Nasal measurements: *see* Facial measurements.
Našili-speakers, in Asia Minor, 135; unknown origin, 180.
Nasion, difficulties in locating, 243, 244.
Natufians, described, **61–62**; compared with Muge midden dwellers, 64; relationship with Ofnets, 68.
Neanderthal man, burials, 14; disappearance of, 17; in fourth glaciation, 20; as *non-sapiens*, **23–25**; in modern dress, *ill.*, 24; hybrids, **25–28**; *ill.*, 35; compared with Afalou, 42; mixture with *sapiens*, 51; and derivatives, *ill.*, 53, 54, *figs.* 7, 8, 9, 10, 11, 12; in racial classification, 290, *chart.*
Negritos, relation to Veddoids, 430.
Negro, as race, 5; as *homo sapiens*, 34; European influence, 296; in Hadhramaut, 426; in Hamitic territory, 447–48; in Egypt, 459.
Negroid characteristics, in Mediterranean, 85; Badarian, 95; in Chamblandes, 115; element in Mesolithic E. Africa, 445; characteristics among E. African Hamites, 451, 452–53, 454–55, 456–58; element in Egypt, 461, in N. Africa, 466, among Tuareg, 471–72, in Senhaja Sghir, 483, in Portugal, 498, in Mediterranean races, 508–509, *ill.*, Plate 20, *figs.* 1–5.
Nejdis, placed, 401; lack of information of, 410; slaves, 426.
Neo-Danubians, classified, 292; geographic distribution, 294–95, *map;* E. Finns as, 345; ancestors of Baltic Finns, 351; element in Poland, 567, in White Russians, 568, in Ukrainians, 570, in Magyars, 585, 586, in Slovenes, 588, in Bulgars, 611, 612, in Vlachs, 617; *ill.*, Plate 31, *figs.* 1–4.
Neolithic period, crania, 14; cranium *ill.*, 54, *figs.* 12–15; defined, 78; discussed, **78–130**; movements and chronology, 80–81, *map* 2; in Swedish Bronze Age, 166; language unknown, 178; survival in British Iron Age, 192; stature survival, 255; in British Isles, 370–71, 395; economy origin, 444; survival in Africa, 445, 467; in Canary Islands, 485; in Sardinia and Corsica, 501; in France, 511, 515; in Belgium, 525; survival among Walloons, 527; in Netherlands, 530; in Germany, 535.
Netherlanders, in London, 375; racial characteristics, **529–35**; Upper Palaeolithic Nordic, *ill.*, Plate 33, *fig.* 1; Nordic blend, *ill.*, Plate 34, *fig.* 1; Dinaric, *ill.*, Plate 36, *fig.* 2. *See also* Holland.
Neufchatel, Lake, Lake Dwelling culture, 113.
Nicopol, Scythian burials, 197.
Nikitsch crania, described, 213.
Nogai Tatars, distribution, 583, 631, *map.*
Nordics, movements traced, 80–81, *map* 2; relation to Mediterraneans, 83; popular definition, 83; type in Bronze Age Bohemia, 164; distribution in Iron Age, 176–77, *chart;* Hallstatt people as, 183; Reihengräber people as, 183; derivations, 183; relation to German Kelts, 189; Scythians as, 199; blend with Armenian, 201; Goths as, 206; Visigoths as, 206; Germanic peoples as 207, 208, 213, 215–16; defined, 208; Slavs as, 218, 220; and Indo-Europeans, 222; origins, 238; racial characteristics, 254, 257, 265, 276, 278, 331, 409; name coined, 280; in Deniker's system, 282, 283; in Sergi's classification, 284; in von Eickstedt's system, 287, 288; in Czekanowski's system, 288; classified, 292–93; geographic distribution, 294–95, *map;* in Norway, 307–23; element in Lapps,

301; Asiatic, and Samoyed, 307; in Sweden, 329; Danes as, 335; types among Letts, 365; Irish as, 378; element in Great Britain, 384, 394, in Canary Islands, 386, in Yemenis, 409, in Kafirs, 420, in Riffians, 483, in Spain, 491, in France, 520, 521, 522, in Belgium, 525, in Flemings, 529, in Netherlands, 532, 534, 535, in Germany, 536, 537, 538, 539, 541, 542, 544–45, 546, 547, in Switzerland, 548, 549, 550, 551, in Austria, 551, in Italy, 554, 556, 558, 559, in Slavs, 559, in Wends, 562, in Poland, 564, 566, 567, in White Russians, 568, in Ukrainians, 570; in Great Russians, 576, in Kirghiz, 580, in Magyars, 586, in Albanians, 601, in Bulgars, 611, 612, in Vlachs, 614, in Armenians, 629, in Ossetes, 632; compared with Shawia, 477; discussion of N. African, 488–89; Corded type, *ill.*, Plate 27, *figs.* 1–4; Danubians, *ill.*, Plate 28, *figs.* 1–4; Hallstatts and Kelts, *ill.*, Plate 29, *figs.* 1–6; exotic, *ill.*, Plate 30, *figs.* 1–6; Upper Palaeolithic type, *ill.*, Plate 32, *figs.* 1–4; Plate 33, *figs.* 1–4; Borreby and Alpine blends, *ill.*, Plate 34, *figs.* 1–4.

Noric, classified, 293; geographic distribution, 294–95, *map;* element in Germany, 543, 544, 546, 547, in Austria, 551–52, in Czechs, 562, in Ukrainians, 571, in Great Russians, 576, in Magyars, 586, in Albania, 601.

Normandy, racial characteristics in, 516.

Normans, in British Isles, 373; racial characteristics, **519.**

North America, glaciation and, 19. *See also* America.

North, races of the, fully described, **297–369.**

Northern Forest people, distribution in Iron Age, 176–77, *chart.*

Northwestern race, in Czekanowski's system, 288.

Norway, Germanic expansion in, 181, 202; Christianity adopted, 202; Iron Age in, 204–05; Lapps in, 299, 300–01, 302, 303, 304.

Norwegians, Iron Age crania compared with W. Germanics, 207; racial characteristics, 261, 265, 268, 273, 276, **307–23;** settlers in Iceland, 324; compared with Icelandics, 325; in British Isles, 373; in France, 512, 516; Brünn type, *ill.*, Plate 4, *fig.* 3; Danubian, *ill.*, Plate 28, *fig.* 1; Hallstatt type, *ill.*, Plate 29, *fig.* 1; Upper Palaeolithic Nordic, *ill.*, Plate 32, *figs.* 1–3.

Nosairi: *see* Alawaya.

Novilara cemetery, contents described, 195.

Oases, races and, **460–62, 468–71;** Berbers, 474, 475; Kharejites, 475–76.

Oban man, described, 75–76.

Obercassel cranium, compared with Afalou, 41; described, 47; compared with Chou Kou Tien, 50, with Pritzerber, 74, with Lapps, 298.

Oberrotweil crania, described, 212.

Ob-Ugrians, language stock, 339, *chart.*

Ofnet crania, described, **66–68;** entrance to N. Europe, 72; compared with Plan, Dömitz, Spandau, 74, with Neolithic Alpine, 118, with Scandinavian Neolithic brachycephals, 124; as origin of Alpine brachycephals, 119; as large brachycephals, 265; survivors in Europe, 291.

Oldoway cranium described, **44–46.**

Omanis, described, 414.

Onas, resemblance to Upper Palaeolithic man, 32; crania, 32–33.

Oranian culture, described, 39–41; in Spain, 47; cranium, *ill.*, 54, *fig.* 10.

Oriental Jews, racial study, **639–42.**

Orkneys, pigmentation, 388, 389.

Oromo, identified, 447.

Oscan language, classified, 193; origin, 554.

Osmanli Turks, conquests, 229; origin, 239, 240; racial characteristics, **617–20;** distribution, 631, *map.*

Ossetes, origin and language, 196; Alans survived as, 197; cranial type, 200; distribution, 631, *map;* racial characteristics, **632;** language identified, 416, *map.*

Osteology, materials and techniques, **12–15.**

Osterdal type, classified, 293.

Osteuropoids, in von Eickstedt's system, 288.

Ostiaks, compared with Finns, 125; classified, 223; migration, 224; origin, 234; racial characteristics, 272, **350–51;** language stock, 339, *chart;* relation to Magyars, 341; *ill.*, Plate 2, *figs.* 2, 3.

Ostrobothnia crania, described, 355.

Ostrogoths, defeated by Huns, 228.

Painted people, movements traced, **80–81,** *map* 2; described, 105.
Palaeasiatics, relation to Huns, 231.
Palaeolithic period, crania in, 14; man discussed, **28–50;** survivals in N. W., 69–76; characteristics outlined, 84; British, relation to Long Barrow, 112; compared with Neolithic, 127; survival in Esthonia, 168; long-heads, distribution in Iron Age, 176–77, *chart;* speech unknown, 178; compared with Iron Age Norwegians, 204; survival in racial characteristics, 254, 261, 265, 267, 276; survivals in Europe, 291; in Norway, 319, in Ireland, 377, 383, in Mediterranean races, 509, in Netherlands, 532, 534, in Montenegrins, 592, 594, 595, in Osmanli Turks, 621; as basis of Nordic, Indo-Europeans, 286; in Lapp ancestry, 305; probable physical appearance, 383–84; origin of Alpines, 647; survivals in Ireland, *ill.*, Plate 9, *figs.* 1–7, in Morocco, *ill.*, Plate 10, *figs.* 1–7; Nordic blend, *ill.*, Plate 32, *figs.* 1–4. *See also* Aurignacians, Magdalenians.
Palestine, Natufians of, 61–62; Bronze Age, 137–38, 141; history and races, **432–34;** Jews in modern, 439.
Pamirs, glaciation and, 19.
Papuans, hybrid origin, 602.
Parisii, placed, 192.
Patema site, people described, 142.
Pathans, identified, 417; study of racial characteristics, **419–20.**
Peia, classified, 595; distribution, 596, *map.*
Peking man, separation from *homo sapiens,* 1.
Permiaks, language distribution in Europe, 338, *map;* language stock, 399, *chart;* racial characteristics, **348–49.**
Permian Finns, placed, 225; language stock, 339, *chart;* racial characteristics, 342, **347–50.**
Persepolis, Neolithic finds, 86.
Persian Empire, founding, 180–81.
Persians, mention of Slavs in writings of, 218; racial characteristics, 418; Jews and, 435, 438; relation to Libyans, 465; in Spain, 490; in Turkestan, 635; *ill.*, Plate 18, *figs.* 3, 8. *See also* Iranians.
Petchenegs, placed, 229; influence on Magyars, 233; in Hungary and Russia, 234.
Philistines, Indo-European and, 180; described, **432–34;** *ill.*, 433, *fig.* 33.
Phoenicians, Bronze Age, 152, 153; in Cornwall, 396; and Jews, 438; in Spain, 490.
Phoenix Park crania, placed, 112.
Piceni, placed, 195.
Picts, language, 187; in Scotland, 372.
Pigmentation, difficulties in technical estimate, **244–45;** correlations, 250; geographic distribution, **269–73,** 270–71, *map;* biology of, **273–77;** blondism, cause of, 273–74; hair color, causes of 274–75; rufosity, causes of, 274–75; of iris, causes of, 275. *Neolithic:* in Egypt, 98. *Bronze Age:* Minoan, 141; Greeks, 145–46; Carthaginian, 153; Danish, 167; Minussinsk, 170. *Iron Age:* Illyrians, 185–86; Keltic, 192; early Roman, 194; Scyths, Sarmatians, Alans, 198; Norwegian, 205; W. Germanics, 207–08; Slavs, 218; Huns, 231; Avars, 231, 232; Huing-Nu, 232. *North:* Lapps, 301–02; Samoyed, 307; Norway, 310–11, 314, 316, 317, 318, 319; Iceland, 324, 325–26; Sweden, 330–31; Denmark, 334–35; Carelians, 342–43; Vepses, 345; Mordvins and Cheremisses, 346; Votiak, 347–48; Syryenians and Permiaks, 349; Ostiaks and Voguls, 350; Livs, 353; Esths, 354; Runö Swedes, 354; Finns, 358–59; Letts, 363; Lithuanians, 366; Lithuanian Tatar, 367–68. *British Isles:* Irish, 380–81, 384; Aran Isles, 381; Kelts, 384; Great Britain, 385–90; Orkneys and Shetlands, 388, 389; Welsh, 385, 387, 389, 390–91; Scots, 385, 387–88, 389; British, correlation with stature and cranial measurements, **395–98.** *Mediterranean:* Yemenis, 404, 405; Hejaz, 409; Mesopotamians, 412; Kuwaitis, 413, 414; Lenja, 414–15; Persian, 418; Afghans and Pathans, 420; Kafirs, 420; Pushtus, 420; Dardic-speakers, 421; Kurds, 421; Turkomans, 423; Azerbaijanis, 425; Hadhramis, 428, 429; Baluchis and Brahui, 431; Samaritans, 439; Yemenite Jews, 440; Mesopotamian Jews, 442, 443; E. African Hamites, 452–53, 454, 457–58; Khargan, 461; modern Egyptians, 460; Siwans and Awjila people, 469; Arabo-Berbers, 470; Tuareg, 472–73; Mzabites, 475; Shawia, 477; Kabyles, 478; Riffians, 481–82; Shluh, 484; Guanche, 485; Canarians, 487; Spaniards, 491, 492, 493–94; Andalusian, 493; Spanish

Moors, 495; Portugal, 496, 497; Corsicans, 499; Sardinians, 500; Basques, 502; Gypsies, 506; Mediterranean races as whole, 507, 508. *Central Zone:* French, 518–20, 521; Belgians, 528; Netherlands, 532; Frisian, 534; Germans, 540; Fehmarn Germans, 541; Vogelberg Germans, 542; Keuperfranken Germans, 543; Miesbacher Germans, 545; Sudeten Germans, 546; Swiss, 550; Lower and Upper Austria, 551; Tyrol, 553; Italians, 555, 557, 558; Czechs, 562; Poles, 566, 567; White Russians, 568; Volhyn Ukrainians, 570; Ruthenians, 572; Great Russians, 574, 575; Chuvash, 577; Bashkirs, 579; Meshcheryaks, 579; Kirghiz, 580; Russian Tatars, 582; Crimean Tatars, 583; Kalmucks, 583; Slovenes, 588; Croats, 588; Serbs, 590; Bosnians, 591; Dalmatians, 591; Montenegrins, 592–93; Albanian Ghegs, 598–99; Greeks, 605–06; Cretans, 608; Bulgars, 611; Vlachs, 615, 616, 617; Osmanli Turks, 620, 621, 622; Lebanese, 624; Cypriots, 625; Armenians, 627–28; Ossetes, 632; Caucasic-speakers, 633; Tajiks, 637; Turkestan Jews, 640; Caucasus Jews, 641; Karaite Jews, 642; Ashkenazim Jews, 644.

Pile Dwelling race, in Czekanowski's system, 288, 289.

Pilous system: *see* Hair form

Piltdown, in racial classification, 290, *chart;* placed, 370.

P-Italic, described, 193.

Pithecanthropus, discussed, 23.

P-Keltic, described, 186–87.

Plau crania, described, 74; placed, 123.

Pleistocene period defined, 1; levels of, 18; climate of, 19–20; in British Isles, 370.

Podrima, classified, 595; distribution 596, *map.*

Poland, as route of Neolithic, 101; Neolithic remains, 102, 103; brachycephaly in Neolithic, 124; Bell Beaker in, 156; Bronze Age, 168; Slavs in, 216, 218; Jews in, 437, 642.

Poles, selection among emigrants, 7–8; racial characteristics, 261, 265, 276, **563–68;** language distribution, 561, *map; ill.*, Plate 7, *fig.* 3; Plate 26, *fig.* 3; Upper Palaeolithic Nordic, *ill.*, Plate 33, *fig.* 4; Dinaric, *ill.*, Plate 35, *fig.* 3.

Polianki crania, placed, 224.

Pollen analysis, use of, 74.

Polon crania, placed, 225.

Pompeiian crania, described, 555.

Pontic, defined, 617.

Population, increase, 17–18, 79; defined, 31; Lapps, 299; Samoyed, 306; 16th century Finnmark, 320; Norway, 320; Iceland, 323–24; Sweden, 326; Finnish in Sweden, 328; Denmark, 332; Ijores and Vodes, 339; Carelians, 342; Mordvin, 345; Cheremisses, 346; Votaiks, 347; Syryenians and Permiaks, 348; Ostiaks and Voguls, 350; Livs, 352; Tatars in Russia, 362; Lithuanians, 365; Arabia, 401; Jews in Iraq, 435–36; Moroccan Berbers, 480; Basques, 501; Gypsies, 505; French, different speeches, 512–13; Belgium, 522–23; 13th century Flemish, 524; Switzerland, 548; pre-Munich Czechoslovakia, 559–60; Chuvash, 577; Magyars, 584; Albania, 595; Assyrians, 630; Tajiks, 634–35.

Portugal, midden dwellers of Tagus, 63–64; Neolithic in, 99–100.

Portuguese, racial characteristics, 257, **495–98;** *ill.*, Plate 22, *fig.* 4; Plate 23, *fig.* 3; Nordic, *ill.*, Plate 30, *fig.* 4.

Pottery, Corded, 82, 107; Fayum, 93; Solana, 100; Neolithic Danubian described, 105; painted, Anau, Kansu, 105; combed, 125; Near Eastern in Almeria, 148; Guanche, 485.

Povoa de Varzin, people described, 497–98.

Prakrit, and Gypsy language, 505.

Předmost crania, described, **36–37;** compared with Chancelade, 48; *ill.*, 53, *fig.* 9; as Irish ancestor, 378.

Pritzerber crania, described, 73–74.

Prizren, Slavic nucleus in, 217.

Prussians, racial characteristics, 546; *ill.*, Plate 7, *figs.* 1, 2.

Puka cranium, placed, 185; classified, 595; distribution, 596; *map.*

Pushtu language, distribution, 416.

Pygmy, as race, 5.

Pyrenees, glaciation and, 19.

Qara, Veddoids among, 425–26; racial characteristics, **427.**

Q-Keltic, described, 186–87.

Queensland, increase of stature in, 9–10; changes in English stock, 45.

Questenbergers, racial characteristics, **545–46.**

Race, theory and principles of concept of, **3–12**; defined, 3, 11; and culture, 174.
Redeyef crania, placed, 98.
Reihengräber people, placed, 183.
Reindeer Lapps, identified, 299.
Religion, of Indo-European speakers, 179; Norse Iron Age, 202; conversion of Franks, 214; conversion of Gepidae and Vandals, 214; Magyar conversion, 233; Ostiaks and Voguls, 341; Syryenians, Permiaks, Votiaks, 349; Letts and Lithuanians, 361; racial differences and, in Ireland, 378–79; and facial characteristics, in Ireland, 382–83; effect on Flemish Belgium, 525; racial differences and, in Germany, 543; division in Switzerland, 548; as source of division in Yugoslavia, 587; influence on Bosnian racial characteristics, 590; Albanians, 595; Bulgars, 610; Syria, 623; in Caucasus, 631–32.
Remedello crania, described, 193–94.
Reproduction, rate as selective factor, 6–7; effects of discovery of, 16.
Rhaetians, survival, 213, 547; in Tyrol, 552.
Rheinzabern crania, placed, 195.
Rhodesiensis, as *non-sapiens*, 23.
Riffians, language, 463, 467; racial characteristics, **480–83**; *ill.*, Plate 10, *figs.* 1–7; Plate 21, *fig.* 6; Nordic, *ill.*, Plate 30, *fig.* 5.
Rigsthula, as aid to racial study, 321–22.
Ringabella crania, placed, 112.
River-bed crania, described, 110.
Romanies: *see* Gypsies.
Romans, Iron Age, discussed, 193–95; in British Isles, 372, 374; migration of Jews among, 436–37; in France, 512; in Belgium, 523–24; in Dacia, 613.
Romansch dialect, distribution, 548.
Rome, and Kelts, 187, 190; religion compared with Norse, 202; settlements pillaged by Germanics, 208; invasion by Huns, 228.
Rothwell crania, described, 373–74, 375.
Round-head: *see* Brachycephaly.
Royal Scyths, described, 198.
Rufosity: *see* Pigmentation.
Rumania, Jews in, 642; language distribution, 561, *map;* Osmanli Turks, 617.
Rumanians, racial characteristics, 265, **612–17**; in Bulgaria, 610; *ill.*, Plate 26, *fig.* 2; Dinaric, *ill.*, Plate 38, *fig.* 2. *See also* Vlachs.
Runö Island, racial study of, 354.
Russe crania, described, 155.
Russia, Neolithic movement from, 82; as route of Neolithic, 101; Bronze Age in, **168–69**; origin of Indo-European, 179; Scyths in, 196; Slavs in, 219–20; Finns and Ugri in, 223–24; Lapps in, 299; Finnic groups in, 345–51; influence on Lithuanian history, 361; migration of Jews to, 436, 437; Turks, Tatars, and Mongols in, 576–84.
Russians, influence in Copper Age Hungary, 155; Great, racial study of, 254–55, 269, 276, **572–76**; White, language distribution, 561, *map;* White, racial characteristics, **368–69**; in Caucasus, distribution, 631, *map;* Nordic, *ill.*, Plate 30, *fig.* 1; Dinaric, *ill.*, Plate 38, *fig.* 1.
Ruthenians, in Czechoslovakia, 559; language distribution, 561, *map;* racial characteristics, **571–72**; *ill.*, Plate 8, *fig.* 1.
Ruwalla, placed, 401; racial characteristics, **410–11**; identified, 623; *ill.*, Plate 16, *fig.* 4; Bedawin, *ill.*, Plate 19, *fig.* 6.

Saaftigen crania, described, 526.
Sacrifice, horse, 179; human, 197, 198.
Sahara, Mesolithic inhabitants of, 60.
Saint-Urnel en Plomeur crania, described, 165–66.
Saka, placed, 196; as drawn by Persians, 199.
Salis Roje crania, described, 126, 351, 360.
Salzburg, racial characteristics, 552.
Samaritans, racial characteristics, 439.
Samen, identified, 299.
Samogitians: *see* Jmouds.
Samoyeds, described, 236; language, 236; derivation, 296; influence on Lapps, 305; racial characteristics, **306–07**; and Ostiaks, 341, 351; and Voguls, 341; mixture with Syryenians, 349; *ill.*, Plate 1, *fig.* 7.
Sandarna finds, 73.
Sanskrit, and Gypsy language, 505.
Sao Pedro Magodouro, people described, 497.
Saracens, in Sardinia, 500.
Sardinia, Bronze Age in, 146–47.
Sardinians, relationship with Egyptians, 95; racial characteristics, 257, **500–01**.
Sarmatians, origin, 196; and Scyths, 197; crania described, 200; element in Ukrainians, 569.

Sarts, origin, 239; racial characteristics, **635, 636.**
Satem, described, 179, 216; Lithuanians and Letts, as speakers of, 360.
Savakot, language classified, 339.
Savoie, Bronze Age in, 165.
Savolaiset, identified, 356.
Savoyards, racial characteristics, 521.
Saxo-Thuringia, in Bronze Age, 162. *See also* Saxony, Thuringia.
Saxons, in Sweden, 328; origin, 333; in British Isles, 372, 389; in France, 512, 519; in Netherlands, 529; distribution in Germany, 537. *See also* Anglo-Saxons.
Saxony, Corded people in, 109; amber trading route, 134; Bronze Age in, 164; racial characteristics, **545–46.**
Sayyids, described, 426, 427.
Scandinavia, glaciation and, 19; and Old Stone Age men, 69; tanged-point and "Lyngsby" axe in, 70–71; Megalithic invasion, 82; Iron Age invasion, 203–04; stature, 254; dolichocephaly in, 257. *See also* Individual countries.
Schleswig-Holstein crania, described, 74.
Sclaigneux crania, placed, 124.
Scotland, Creswellian and Maglemose in, 75; Bronze Age in, 160–61; Q-Keltic in, 187; Danes in, 211. *See also* British Isles.
Scotsmen, in Iceland, 324; in Sweden, 328; in Faroes, 336; racial characteristics, 261, 265, 371, 372, 375–76, **385–93,** 395, 399; *ill.*, Plate 12, *fig.* 1; Plate 24, *fig.* 4; Plate 25, *fig.* 4; Upper Palaeolithic Nordic, *ill.*, Plate 32, *fig.* 4.
Scyths, Bronze Age migrations, 135; clothing, 188; racial characteristics, **195–201;** *ill.*, 198, *fig.* 29; compared with Iron Age Danes, 203, with Wends, 219, with Finns, 225, with Hiung-Nu, 227; as block to Finnish expansion, 224; relation to non-Mongoloid Avars, 232, to Finno-Ugrians, 236; survivals, 260; element in Ukrainians, 569; in Crimea, 582.
Sebilian culture, placed, 92.
Sedentary Lapps, identified, 299.
Seli, placed, 360.
Seljuks, conquered by Osmanlis, 229; origin, 239; in Asia Minor, 618.
Semites, influence in Mesopotamia, 90.
Semitic, as linguistic stock, 178; in Arabia, 403; in Africa, 445; distribution in E. Africa, 446, *map.*
Senhaja Sghir, origin, 463, 465–66; and origin of Riffians, 480; distribution, 480; racial characteristics, **483.**
Sephardim Jews, described, 437, 438, 443; *ill.*, Plate 45, *fig.* 1.
Serbia, Slavic nucleus in, 217; Gypsies in, 506.
Serbs, language, 216; language distribution, 561, *map;* racial characteristics, 587, **588–95;** in Rumania, 612; Dinaric, *ill.*, Plate 39, *fig.* 1.
Serials, list of, and abbreviations, 684–91.
Sevan crania, described, 201.
Sex differentiation, among Skhuls, 27; in Upper Palaeolithic group, 31; Afalou, 41, 42; in Elmenteitan, 58; in Muge midden dwellers, 64; Ofnet crania, 67; in Mediterraneans, 85; in Badarians, 94; in Chamblandes, 115; in modern Europe, 256; hairiness and, 278; in Norway, 315, 319.
Shahara, language, 403; Veddoids among, 425; racial characteristics, **427.**
Shammar, placed, 401.
Shankalla, identified, 448.
Shawia, language, 467; racial characteristics, **476–77.**
Sheshawen Moors, described, 495.
Shetland Isles, brachycephaly in, 261; pigmentation, 388, 389.
Shluh, identified, 467; distribution, 480; racial characteristics, **484;** *ill.*, Plate 21, *fig.* 5.
"Shoe-last celt," described, 105.
Short Cist people, described, 160.
Shoulder width: *see* Body form.
Shuqkah skeletons, described, 62.
Siberia, glaciation and, 19; Slavic invasion, 217.
Sicilians, stature, 255; *ill.*, Plate 24, *fig.* 1.
Sicily, Bronze Age in, 146, 147.
Sidamos, distribution, 446; racial characteristics, **449–57.**
Silesia, Danubian settlers, 104; Corded crania, 107; Bronze Age in, 162; Hallstatt culture in, 184; brachycephaly in, 260.
Silures, identified, 393.
Sinanthropus, discussed, 23.
Siwans, origin, 463; language, 467; racial characteristics, **468–69.**
Skane, brachycephaly in, 123.
Skeletal measurements, criteria for, 15; Galley Hill man, 21, Skhul, 26; Upper Palaeolithic man, 32; Grimaldi, 33–34; Afalou, 41; Asselar man, 60; Muge

midden dwellers, 64; Téviec, 66; Bronze Age Cypriots, 140; Gemeinlebarn, 163; Lapps, 303; Norway, 310. *See also* Body form.
Skhul men, described, **26–28**; compared with Upper Palaeolithic group, 31, 37, with Grimaldi, 34, with Předmost #3, 36, with Afalou, 42; *ill.*, 53, *fig.* 8; in racial classification, 290, *chart.*
Skien crania, placed, 205.
Skin color: *see* Pigmentation.
Skoplje, Slavic nucleus in, 217.
Slash-and-burn system, effects of, 79.
Slavic speech, classified, 179.
Slavs, distribution in Iron Age, 176–77, *chart;* expansion in Iron Age, 181; in Iron Age, **216–20**; eyes, 268, 278; in Deniker's system, 283; mixture with Samoyeds, 307; in Spain, 490; in Germany, 537; Czechs and Wends, **559–63**; in Poland, **563–68**; in Russia, 563, **568–76**; in Hungary, 584; Serbs, Croats, and Slovenes, **587–95**; in Greece, 604; in Bulgaria, 609–10; in Dacia, 613.
Sleyb: *see* Solubbies.
Slovaks, number in Czechoslovakia, 559; racial characteristics, **562**; Dinaric, *ill.*, Plate 36, *fig.* 4; Plate 37, *fig.* 1.
Slovenes, language distribution, 561, *map;* racial characteristics, **587–88**.
Socotrans, language, 403.
Sogn crania, described, 205.
Solana crania, described, 100.
Soloensis, as *non-sapiens*, 23–24.
Solubbies, described, 411; *ill.*, Plate 16, *fig.* 5.
Solutre #2, cranial measurement, 35, 36; brachycephaly, 39; relation to Ofnet, 68.
Solutrean culture, compared with Magdalenian, 46; cranium, *ill.*, 53, *fig.* 9; as origin of Alpine brachycephals, 119.
Somalis, compared with Oldoway, 45, with Badarians, 95, with Tuareg, 473; identified, 426; racial characteristics, 445, 447, **449–57**; *ill.*, Plate 20, *fig.* 1.
Soyots, identified, 306.
Spain, Magdalenian crania, 47; Capsian and Oranian culture in, 47; Magdalenian survival in, 65; Neolithic in, 82, **99–100**; Copper and Bronze Age in, 146, **148–50**; Bell Beakers, 157; and Food Vessel peoples in, 162; Kelts in, 187; invasion by Visigoths, Gepidae, Vandals, 205; migration of Jews to, 437; Zenata in, 463; and Canary Islands, 486–87; rule over Sardinia, 500; Basques in, **501–04**; Gypsies in, 505.
Spandau crania, described, 74; placed, 123.
Spaniards, racial characteristics, 257, 269, **489–95**; *ill.*, Plate 22, *fig.* 3; Plate 24, *fig.* 2.
Spaniols: *see* Sephardim.
Spartans, modern resemblance to, 146.
Sphakiots, racial characteristics, **608–09**.
Spitalsfield crania, described, 374.
Split crania, placed, 185.
Spreewald crania, described, 184.
Stångenäs skeleton, described, 73; compared with Pritzerber, 74, with MacArthur Cave B., 75, with Iron Age Norwegians, 204.
Stanleys, identified, 506.
Statistics, use in physical anthropology, 245–51.
Stature, increase, as environmental response, 9–10; as measure of genetic affinity, 28; difficulties in technique of measuring, 242; in modern Europe, **251–55**, 252–53, *map;* relation to weight, 255–56, to head size, 264, to pigmentation, 277. *Pleistocene:* Combe Capelle, 34; Crô-Magnon, 35; Upper Palaeolithic, 37, 84; Afalou, 40–41; Gamble's Cave and Oldoway, 44; Chancelade, 48; Elmenteitan, 59; Asselar, 60; Natufians, 62; Téviec, 66; Murzak Koba, 68; Stångenäs, 73. *Neolithic:* Mediterranean, 84; Megalithic, 85; Corded, 85, 104, 108, 109; Naqada, 95; Algerians, 99; Portuguese 100; Zizernaberd, 102; Kurgan, 103; Mariupol, 103; Poland, 103; S. Russia, 103, 104; Banded, 106; Long Barrow, 111; French, 116; Alpine, 118–19; Scandinavian, 122, 123; Alpine and Borreby, 124. *Bronze Age:* Alishar, 136; Anatolian, 137; Cypriots, 140; Minoan, 141; Mid-Helladic, 144; Sicilians, 147; Corsican, 147; Italians, 147; Spaniards, 149; Bell Beaker, 156, 158; Short Cist, 160; Scots Food Vessel, 160; Gemeinlebarn, 163; Aunjetitz, 164; Danish, 167; Esthonian, 167; S. Russian, 169. *Iron Age:* Hallstatt, 183; Gauls, 191; British Kelt, 192; early Roman, 194; Novilara Illyrians, 195; Scyths, 200; Danes, 203; Norwegians, 204; W.

Germanics, 207; Anglo-Saxons, 209; Bajuvars, 211; Franks, 215; Slavs, 218; Huns, 230; Avars, 230; early Magyars, 233. *North:* Lapps, 303; Samoyeds, 307; Norwegians, 309, 310, 314, 315, 317, 318, 319, 320; Icelandics, 324, 325; Swedes, 329, 331; Danes, 333, 336; Faroe Islanders, 336; Carelians, 343; Ijores, 345; Evremeiset and Savakot, 345; Vepses, 345; Mordvins and Cheremisses, 346, 347; Votiak, 347; Syryenians and Permiaks, 349; Ostiaks and Voguls, 350; Livs, 352; Esths, 353; Runö Swedes, 354; Finns, 356–57; Letts, 362; Lithuanians, 365–66. *British Isles:* fifteenth century British, 373–74; Irish, 377, 378, 379; Aran Islanders, 379; English, 390–91; Scotsmen, 390–91; Welsh, 390, 391; Cornish, 390; British, correlation with pigmentation and cranial measurements, 395–98. *Mediterraneans:* Yemenis, 403; Hejaz, 409; Ruwalla, 410; Shammar, 410; Bedawin, 410; Mesopotamians, 411–12; Kuwaitis, 413; Omanis, 414; Lenja, 414; Persian, 418; Afghans and Pathans, 419; Kafirs, 420; Dardic-speakers, 420; Burushaski, 421; Kurds, 421, 422; Turkomans, 422, 424; Hadhramis, 427; Baluchis, and Brahui, 431; Samaritans, 439; Palestine Jews, 439; Mesopotamian Jews, 442, 443; N. African Jews, 443; E. African Hamites, 449–50, 457; modern Egyptians, 459; Khargans, 461; Awjila people, 468; Magiabra people, 469; Marabutic tribes, 470; Arabo-Berbers, 470; Tuareg, 472; Mzabites, 475; Kharejites, 475; Algerian tribesmen, 476; Kabyles, 478; Riffians, 480; Ghomara, 483; Shluh, 484; Guanche, 486; Canarians, 487; Spaniards, 491; Andalusians, 493; Portuguese, 496, 497; Corsicans, 499; Sardinians, 500; Basques, 502; Gypsies, 506. *Central Zone:* French, 513–15, 521; Bretons, 514; Belgians, 526–27; Flemings and Walloons, 526; Mendonck Belgians, 528, 529; Netherlanders, 532; Frisian, 533; Germans, 539–40; Fehmarn Germans, 540; Vogelberg Germans, 542; Keuperfranken Germans, 542; Lake Constance Germans, 543; Genkingen Germans, 544; Miesbacher Germans, 545; Sudeten Germans, 546; Swiss, 549; Austria, 551, **552**; Tyrol, 552; Italians, 555, 556, 558; Czechs, 562; Wends, 562; Poles, 564, 565; White Russians, 568; Volhyn Ukrainians, 569, 570; Ruthenians, 571, 572; Great Russians, 573; Chuvash, 577; Bashkirs, 578; Meshcheryaks, 578; Khirgiz, 579; Crimean Tatars, 583; Kalmucks, 583; Magyars, 585; Slovenes, 588; Croats, 588; Serbs, 589; Bosnians, 590; Dalmatians, 591; Montenegrins, 591, 592; Albanian Ghegs, 597; Toscs, 602; Greeks, 605, 606, 607; Cretans, 608; Bulgars, 610; Vlachs, 614, 615, 616; Osmanli Turks, 619; Lebanese, 623; Cypriots, 625; Armenians, 626; Assyrians, 630; Tats, 632; Ossetes, 632; Tajiks, 636; Turkestan Jews, 639; Caucasus Jews, 641; Karaite Jews, 642; Ashkenazim Jews, 643.

Statzendorf crania, described, 183.

Steinkjar, Lapp burials, 301.

Stellmoor, excavations, 71.

Steppe Tatars, racial characteristics, 583.

Stillfried, crania described, 164.

Stoneyisland crania, placed, 112.

Strandloopers, compared with Wiltonians, 59.

Styria, Slavs in, 219.

Subnordic, in Czekanowski's system, 288.

Sudanese, distribution in E. Africa, 446, *map*.

Sudeten Germans, racial characteristics, 546.

Sumerians, compared with Englishmen, 83; study through politics and language, 174; language, 175; relation to Finno-Ugrian, 175; burials compared with Scythians, 197; racial influence, 239.

Suomalaiset, identified, 356.

Susa, Neolithic finds, 86.

Suyun-Djadji, racial characteristics, **424**.

Svaerdborg finds, described, 73.

Swanscombe man, described, 20; in racial classification, 290, *chart;* placed, 370.

Sweden, effect of emigration on, 8; Ertebølle culture in, 72; Neolithic crania, 122; brachycephaly in, 123; Bronze Age in, 166–67; Germanic expansion in, 181, 202; Iron Age in, 204; Goths, Vandals, Gepidae from, 205; Lapps in, 299, 301, 302, 303; geography, 308, 334; Finnish invasion of, 340; Gypsies in, 505.

Swedes, in Iceland, 324; racial characteristics, 265, 276, **326–32**; mixture with

Esths, 354; Runö, 354; pigmentation compared with Finns, 358; Brünn type, *ill.*, Plate 4, *figs.* 1, 2, 4; Borreby type, *ill.*, Plate 5, *fig.* 2; Corded type, *ill.*, Plate 27, *fig.* 2.
Swiss, racial characteristics, 260, **547–50**; *ill.*, Plate 12, *fig.* 3; German Nordic blend, *ill.*, Plate 34, *fig.* 3.
Switzerland, Neolithic in, 113–15; Bronze Age in, 165; Urnfields culture in, 171; Hallstatt culture in, 184; Kelts in, 191; Alemanni in, 206, 212; West Germanics in, 211.
Syria, origin of Dinarics, 140, 173; Gypsies in, 504; racial study of, 622–25.
Syriac language, identified, 630.
Syrians, racial characteristics, 151, 261, 266, **623–25**; *ill.*, Plate 15, *figs.* 1, 2; Plate 17, *fig.* 2; Dinaric, *ill.*, Plate 41, *figs.* 1, 3.
Syryenians, language distribution in Europe, 338; Bolgars and, 341; racial characteristics, **348–49**.
Szekelers, racial characteristics, 260, **584**, 585.

Tabun female, described, 26.
Taches noires, described, 514–15.
Tagus, midden dwellers of, 63–64.
Tajiks, racial characteristics, 239, 417–18, 634–39; compared with French Alpines, 518; *ill.*, Plate 3, *fig.* 5; Plate 15, *fig.* 5; Dinaric, *ill.*, Plate 43, *fig.* 6.
Takhtadshy, identified, 621.
Tanganyika crania, described, 445.
Tanged-point cultures, extent, 70–71.
Tardenoisian culture, origin, 39; appearance of, 56; in France, 65; relation to Ofnet skulls, 67.
Tasian culture, described, 93.
Tasmanians, survival of, 17.
Tatars, appearance in Europe, 229; origin, 239; and Votiak speech, 347; influence on Volga Finns, 349; Lithuanian, racial characteristics, 362, **367–68**; language distribution, 561, *map;* influence on Ukrainians, 569; of European Russia, racial study of, 572, **576–84**; in Bulgaria, 610; in Rumania, 612, 613; in Turkestan, 635.
Tats, identified, 630; distribution, 631, *map;* racial characteristics, **632**.
Taurondontism, described, 25.
Tavastians: *see* Hämäläiset.
Tebessa crania, placed, 98.
Teeth, of Galley Hill man, 22; of Neanderthal man, 25; modifications in, 29; Grimaldi, 33; Afalou, 43; Pritzerber, 73.
Tehennu, described, 464.
Tehuelche, compared with Upper Palaeolithic man, 32.
Telengets, crania described, 234–35.
Terremare settlements, placed, 193.
Teutonic: *see* Nordic.
Teuto-Nordic, in von Eickstedt's system, 288.
Téviec crania, *ill.*, 52, *fig.* 6; described, **65–66**; compared with Montardit, 66, to N. Africans, 99.
Thebans, in Bronze Age Greece, 144.
Thebes, cranial material, 91.
Thessaly, Serbs in, 589.
Thracians, areas occupied by, in Iron Age, 176–77, *chart;* speech classified, 179; lack of information on, 201; in Yugoslavia, 588; described, **609–10**.
Thuringia, Corded people in, 109; amber trading route, 134; Bronze Age, 164; Thuringians enter, 206.
Thuringians, origin, 206; described, **212–13**; distribution, 537.
Ticuso crania, described, 100.
Tigrigna language, distribution, 446, *map*.
Tin, early use of, 134.
Tirana Gypsies, described, 506.
Tiszadersz crania, classified, 232.
Tokharian, speech classified, 179.
Tököl crania, described, 156.
Tonsberg crania, placed, 204–05.
Tooth-knocking, Afalou, 43; Ofnet, 68.
Topography, and race, 11.
Toscs, identified, 595; racial characteristics, **602–04**; *ill.*, Plate 14, *figs.* 3, 4.
Trephination, Ticuso, 100.
Tronder type, defined, 292, 319; in British Isles, 372; *ill.*, Plate 32, *figs.* 3, 4.
Troy, described, 137.
Tuareg, racial characteristics, 255, 257, **471–74**; origin, 463; language, 467; *ill.*, Plate 21, *fig.* 3.
Tumtu, identified, 447.
Tungus, compared with Lake Baikal, 126; with Huns, 231, 232; classified, 237; European influence, 296.
Tunisia, races described, **474–79**.
Turanid, defined, 635.
Turkestan, Bronze Age in, 169; survival of Iranian in, 198; Jews in, 438, **639–41**; racial study of, **634–38**; racial types, *ill.*, Plate 3, *figs.* 4–6.

Turkomans, origin, 239, 240; racial characteristics, 255, 264, 268, **422–24**; relation to Osmanli Turks, 622; in Turkestan, 635; *ill.*, Plate 17, *fig.* 5.
Turko-Tatars, compared with Bazaiha woman, 126.
Turkey, language distribution, 561, *map.*
Turks, Bronze Age migrations, 135; Altaian, mythology, 179; compared with Scyths, 196–97; discussed, 227, **229–36**; among Magyars, 234, 584, 585; mixture with Mongols, 235; language, 236; distribution in Europe, 338, *map;* racial origin, 237; Anatolian, brachycephaly in, 261; head size, 266; influence on Savoyedic, 306; study of as Mediterraneans, 422–25; in Egypt, 459; in European Russia, **576–84**; Ottoman, in Balkans, 589, 604, 612, 613; element in Bulgars, 611, 612; Osmanli, **617–22**; in Turkestan, 634; *ill.*, Plate 17, *fig.* 1; Dinaric, *ill.*, Plate 40, *figs.* 1–3.
Tyrker, identified, 317.
Tyrol, Bolognese type in, 559.
Tyrolese, racial characteristics, **552–53**.
Tyrrhenian Sea, route of Copper Age Dinarics, 148.
Tziganes: *see* Gypsies.

Ugrians, Magyars as, 233; migrations, 234, 341; language, 236; stock, 339, *chart;* mixture with Samoyeds, 307; in Hungary, 584; in Bulgaria, 609; *ill.*, Plate 2, *figs.* 1–4. *See also* Finno-Ugrians.
Ukraine, Neolithic remains in, 102, 103, 104; Bronze Age in, 168; Urnfields culture, 172; and Slavic origin, 216; Slavic skulls described, 219–20; language distribution, 561, *map;* Jews in, 642.
Ukrainians, racial characteristics, 254, 261, **568–71**; in Poland, 563; *ill.*, Plate 14, *fig.* 2; Danubian, *ill.*, Plate 28, *fig.* 3; Neo-Danubian, *ill.*, Plate 31, *fig.* 2.
Umbrians, language classified, 193; origin, 554.
Umm Qatafa cranium, described, 138.
Unetiče culture: *see* Aunjetitz culture.
Upper Austria, racial characteristics, 551–52.
Ur, Neolithic in, 86, 88.
Ural-Altaic, as linguistic stock, 178.
Uralic language, speakers of, **223–40**; languages based on, 236; Samoyedic as, 306; European distribution, 338, *map.*
Uriankhai, identified, 306.
Urnfields culture, described, 171; relation to Illyrians, 186; settlement in Italy, 193; as Nordic, 221; in Germany, 536.
Uruk culture, placed, 87.
Uzbegs, origin, 239; racial characteristics, **635–36**; *ill.*, Plate 3, *fig.* 4.

Vandals, and Alans, 197; speech, 205; conversion to Christianity, 214; origin, 327; in Spain, 490; migrations, 536.
Vandancourt crania, described, 116.
Vedda, survival of, 17.
Veddoids, study of racial characteristics, 266, **425–31**; mixture with Arabian Mediterraneans, 407; element in E. Africa, 448, in Mediterranean races, 509; *ill.*, Plate 19, *figs.* 4–6.
Vendée crania, placed, 191.
Veneti, Illyrian speech, 181; origin, 182; placed, 195.
Vepses, language distribution in Europe, 338; language stock, 389, *chart;* placed, 340; racial characteristics, **345**.
Viking, survival in W. Norway, 316; defined, 323.
Villafratti crania, described, 147.
Villanova people, speech, 181; settlements placed, 193.
Vinzen crania, described, 213.
Visigoths, invasion of Spain, 205; crania, 206.
Vistulan race, in Deniker's system, 283.
Vlachs, racial characteristics, 272, **613–17**; element in Dalmatians, 591; in Greece, 604. *See also* Rumanians.
Vodes, language classified, 338; placed, 340.
Vogelbergers, racial characteristics, 542–43.
Voguls, compared with Finns, 125; classified, 223; migration, 224; origin, 234; language distribution in Europe, 338, *map;* language stock, 339, *chart;* relation to Magyars, 341; racial characteristics, **350–51**; *ill.*, Plate 2, *fig.* 4.
Volga Finns, language stock, 339, *chart.*
Volhynians, Neolithic remains, 104; racial characteristics, **569–71**; *ill.*, Plate 14, *fig.* 2.
Völkerwanderung, effect of, 8; placed, 202; Swedish origin, 327; Danish, 333; effect on Denmark, 336, 337; described, 536–37.

Volosovo cranium, described, 126.
Votiaks, language distribution in Europe, 338, *map;* language stock, 339, *chart;* Bolgars and, 341; racial characteristics, **347–48.**

Wales, possible route of Scots Bell Beakers, 160; P-Keltic in, 187. *See also* British Isles, Welsh.
Wallachia, racial study of, 612–13.
Walloons, racial characteristics, 272, 523, 524, 525, **526–29;** in Sweden, 328; *ill.,* Plate 13, *fig.* 4. *See also* Belgium.
Walser, racial characteristics, 554.
Warka cranium, described, 86, 87
Watta, identified, 447.
Waziris, identified, 417.
Weight, body, in modern Europe, 255–56; relation to head size, 264. *See also* Body form.
Welsh, language, 387; racial characteristics, 265, 269, 277, 384, 385, 387, 389, 391, 392, 393, 395, **396–98,** 399; *ill.,* Plate 25, *fig.* 3.
Wends, survival after Slavic invasion, 217; described, 219; survival in Germany, 540; racial characteristics, 559, **562–63;** language distribution, 561, *map.*
West Frisians, described, 261, 531.
Whitechapel crania, described, 375.
White Russians, racial study of, **568–69;** Jews and, 642, 646; *ill.,* Plate 6, *fig.* 4; Neo-Danubian, *ill.,* Plate 31, *fig.* 1.
Wiltonians, described, 59.
Windmill Hill culture, described, 110; survival in Great Britain, 397.
Wörms crania, described, 109, 156; compared with British Bell Beaker, 159.
Würtemburg crania, described, 183–84.

Yemenis, agriculture, 78; placed, 402; racial study of, **403–08;** Veddoids among, 425; *ill.,* Plate 16, *figs.* 1–3; Dinaric, *ill.,* Plate 43, *fig.* 2.
Yemenite Jews, racial characteristics, **439–41.**
Yiddish, origin, 437.
Yomuds, racial characteristics, **422–24.**
York, Roman burials, 194.
Yugoslavia, Copper Age in, 155; Keltic in, 190; racial study of, 587–95; Osmanli Turks in, 617.
Yürüks, agricultural habits, 618; racial characteristics, 621.

Zadrima, classified, 595; distribution, 596, *map;* racial characteristics, **597.**
Zealand, brachycephaly in, 123.
Zemgali, speech, 360.
Zenata, origin, 463; invasion, 465, 466; and Tuareg origins, 474; and origin of Riffians, 480.
Zizernakaberd cranium, described, 102.
Zoned Beaker culture, origin of, 156; in British Isles, 159, 371.
Zuid Beveland crania, described, 531–32.
Zyrians, language stock, 339, *chart.*